November

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HUGO GERNSBACK
EDITOR

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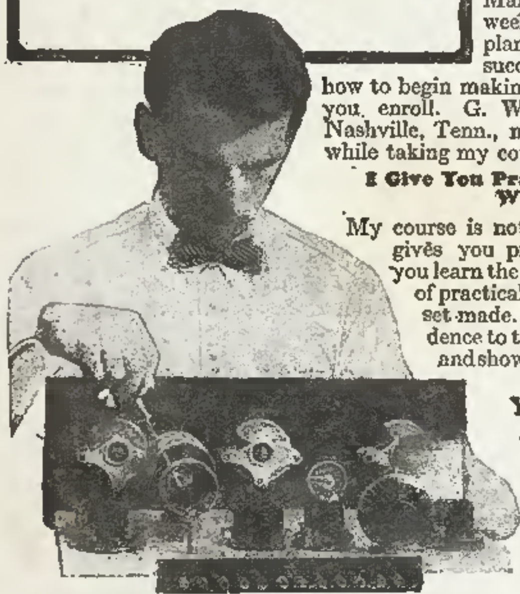

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JULES VERNE'S TOMBSTONE AT AMIENS PORTRAYING HIS IMMORTALITY

AMAZING STORIES

November, 1928
Vol. 3, No. 8

EDITORIAL & GENERAL OFFICES: 230 Fifth Ave., New York City
Published by Experimenter Publishing Company, Inc.

H. GERNSBACK, Pres.; S. GERNSBACK, Vice-Pres. and Treas.
C. E. ROSENFELT, Sec'y

Publishers of SCIENCE & INVENTION, RADIO NEWS, RADIO LISTENERS' GUIDE, AMAZING STORIES QUARTERLY, YOUR BODY

Owners of Broadcast Station WRNY

In Our November Issue:

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By Walter Kateley 738

The Living Test Tube
By Joe Simmons 744

Our Cover

this month depicts a scene from "The Moon Men," by Frank Brueckel, Jr., showing our pioneers emerging from their space-flyer, after having unexpectedly landed on Ganymede, the third of Jupiter's satellites, and beholding a tremendous disc (Jupiter) striped with broad, red bands and whitish-yellow ones, spread over an enormous part of the heavens.

In Our Next Issue:

THE WORLD AT BAY, by B. and Geo. C. Wallis. (A Serial in Two Parts) Part II. The chapters of the final instalment of this story are vibrant with excitement and strategy and interesting possible means for combatting the horrors of the Troglodytes and their unknown deadly poisonous gas. It is no mean job to fight the fiends in their strangely devised helicopters, run by radium energy. But not once is the human interest part of the story allowed to lag.

THE SPACE BENDER, by Edward L. Rementer. May it not, after all, have been purely accidental that the anthropoid adapted itself to varying conditions on this planet more quickly than the others, and so finally evolved into the higher animal—a human being? It is an interesting conjecture, what the results of a snake or fish ancestry, for instance, would be like. Our new author has chosen an interesting subject, to which he does full justice in this story.

BEFORE THE ICE AGE, by Alfred Fritchey. We know practically nothing about the "pre-record" day civilizations. What did the people in the days of the Aramaic language, for instance, use to build and mold? This story, told with the easy facility of sailor-inn charm and freshness, makes delightful reading, though there is plenty of food for thought.

THE APPENDIX AND THE SPECTACLES, by Miles J. Breuer, M.D. We are sure that all those readers who have read Dr. Breuer's short stories of medical science and psychology, will be glad to welcome him back. In this new story, our author enters into a slightly new combination with his medical science—if anything, more successfully than ever.

And others.

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AMAZING STORIES is published on the 5th of each preceding month. There are 12 numbers per year. Subscription price is $2.50 a year in U. S. and possessions. Canada and foreign countries $3.00 a year U. S. coin as well as U. S. stamps accepted (no foreign coin or stamps). Single copies, 25 cents each. All communications and contributions to this journal should be addressed to Editor AMAZING STORIES, 230 Fifth Ave., New York, N. Y. Unaccepted contributions cannot be returned unless full postage is included. Publishers are not responsible for Mss. lost. ALL accepted contributions are paid for on publication.

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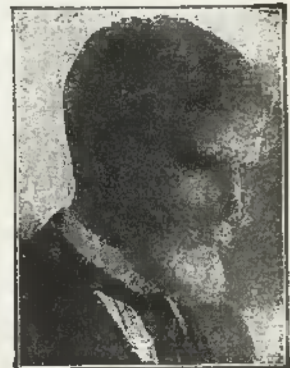

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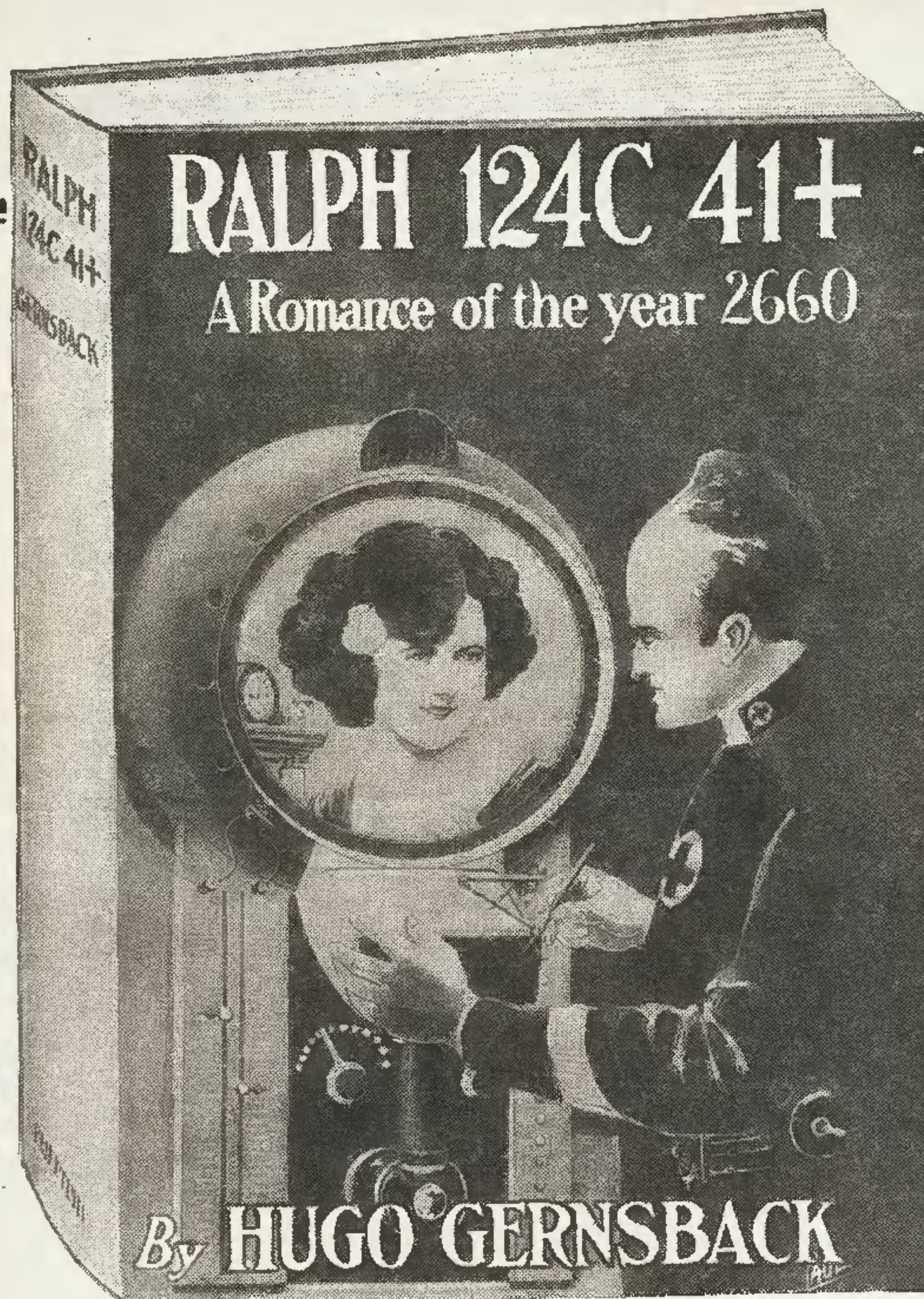

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This was in the days before broadcasting had even been thought of, and before we had the radio telephone, yet all of this is faithfully chronicled in this story.

Old-time readers of "Modern Electrics" probably remember the story, and now have a chance to get the complete book.

A pioneer in the electrical and radio field, Mr. Gernsback has a profound knowledge of the subjects, coupled with a finely trained and highly imaginative mind.

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VOLUME 3

AMAZING STORIES

NOVEMBER, 1928
No. 8

THE MAGAZINE OF SCIENTIFICTION

HUGO GERNSBACK, *Editor*
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AMAZING LIFE

By HUGO GERNSBACK

ONE of the most astounding traits of the human mind is that it seldom compares the human body to other living creatures. Few people, as a matter of fact, stop to consider and ponder how the rest — the non-human creatures — get along, although it would pay most of us to make such an investigation.

Consider such a well-known creature as the fish, which lives a totally different sort of life from that of the human being. Although distantly related to us, the fish has neither lungs to breathe with nor the sort of blood circulation that we have. Yet, he manages to get along rather nicely, in a medium that is totally different from ours.

The truth of the matter is, that in nature, we find life distributed in practically every conceivable strata, and it may be said without contradiction, that if necessary, the creatures will adapt themselves to the most astounding environments—environments incomprehensible to us.

It is impossible for a human being—unless steel-incased—to dive more than 350 feet under water. At a greater depth than this, the pressure of the water becomes so great as to cause "bends" or caisson sickness, as well as other serious disorders.

It was long argued, that even fish would find it impossible to exist at a lower depth than 200 or 300 feet. Yet, the Albatross Expedition some years ago brought up a specimen caught at a depth of over 17,494 feet, where the water pressure per square inch was at least 5,500 pounds. Compare this with a little over 14 pounds of pressure to which the human body is subjected by our own atmosphere. Yet, the deep-sea fish managed to get along very well, simply because they have adapted themselves to their surroundings. More astonishing still, is the fact that some of these deep-sea fish which have chosen the bottom of the ocean as their domain, where perpetual darkness reigns, manufacture their own light, either through their eyes or through other light-giving spots distributed along their bodies. Thus, it will be seen that some of them have overcome almost insurmountable obstacles, i.e., tremendous pressure and lack of light.

Neither great heat nor extreme cold seems to discourage the generation of life. Of course, there is a limit to the temperature variations, because no living being has thus far been known to exist in temperatures such as boiling water. Yet, even here, there are bacteria which can live in boiling water for a few minutes—anthrax, for instance.

Ice, at ordinary temperature, that is, around 30 degrees Fahrenheit, seems to be no deterrent to life. A good many micro-organisms can readily be found in ice, while even such high organisms as fish can be frozen stiff and left in this condition for days and months at a time, after which they can be thawed out and revived, without much trouble. Even the lack of the all-important oxygen does not necessarily spell a death-knell for all living creatures. For instance, we will find certain insects and other small organisms abounding at the tops of our highest mountains, where the air pressure has been reduced a great deal, and where oxygen is not as abundant as it is at sea level. Not only are they there, but these organisms continue to live comfortably with comparatively little oxygen, in a temperature that is usually a great deal below freezing.

Svante Arrhennius, the famous Scandinavian scientist, many years ago, built up a theory by which he intended to prove that it was not at all impossible that life was transmitted from one planet to another, throughout the universe. Arrhennius argued that it is quite possible that small micro-organisms are thrown to such heights into our upper atmosphere, that in time, due to volcanic and other forces, they are ejected into outer space, there to float for years and centuries and thousands of years before they come into contact with other habitable worlds. Of course, these organisms might be quite microscopic; in fact, they would have to be, in order to float to the highest part of our atmosphere, from where they could be driven out into space. Upon landing on a distant planet, where the conditions of life would be right, the organisms would come to life, just as a frozen fish will come to life in tepid water.

Arrhennius, indeed, was the first savant who imagined that any living organism could exist in the interstellar cold, which is—459.4 degrees below zero Fahrenheit, and at the same time live in an almost perfect vacuum, a thing that has never been conceded before.

Yet, there is no good reason to believe that living beings, even of a comparatively higher order, should not find it possible to live quite comfortably in a vacuum and at absolute zero. If nature should find it necessary to evolve a creature to live under such conditions, it seems quite likely that it could be, and perhaps has been, accomplished.

Mr. Hugo Gernsback speaks every Tuesday at 9.30 P. M. from WRNY (326 meters) and 2XAL (30.91 meters) on various scientific subjects.

The WORLD *at* BAY

By B. and Geo. C. Wallis

The First Hint of the Storm

THOUGH writing is my trade, I approach the task of telling this story with some misgivings; yet I believe I can write this story from fuller personal knowledge than any other person can.

Rita, of course, is helping me, and Dick and John. The memory of that awful time, of the things I saw and of the part I played in that great struggle, seems now like a noxious dream. Yet it was no dream. It was a terror, beside which the terrors of the Great War were only as the rumblings of stage thunder.

I do not propose to more than mention here the great shock that made the earth tremble on September 19, 1936; a shock that was recorded on all the seismographic stations of the world, and caused much loss of life in South America. That will be explained at the proper time.

Our first news of the People of the Underworld was dramatic in the extreme.

I was staying in the New York Head Office waiting for news of the settlement of a big industrial dispute, when Dick Martin burst in like a whirlwind.

"I've got it, boys!" he shouted. "I've got IT. Queerest yarn ever. Some men picked up from an open boat yesterday by a tramp steamer south of Valparaiso. Said they were the sole survivors of the liner *Fuji*. Ship had been attacked suddenly by an airplane, which could rise and fall vertically. Airplane fired a sort of gun at the ship, and when the shell burst, a cloud of fog smothered the *Fuji*. The men who escaped got below before the fog reached them and took refuge in the engine-room.

"The airplane people then dispersed the fog in some way, came down, and landed on deck. They were a kind of men, but queer. The engineers kept them at bay with blasts of superheated steam, and after a time the airplane rose again and fired another shell. The rescued sailors were the only two who got off safely in one of the boats. The chaps in the airplane didn't bother pursuing them."

"Who stuffed you with that yarn?" said I. "Was the good old sea-serpent there also?"

"Still, it's a fact that the *Fuji* is four days overdue," said Johnson.

"And also a fact," Dick added, "that the said overdue liner, a hopeless derelict, with a load of dried and shriveled bodies, has just been salvaged by a British vessel. As for your query, Max—I got my information direct by a cable from a friend in Valparaiso."

"Of course you've got convincing details," I jeered. Something curious has happened, no doubt, but a helicopter aero, with a sort of gun, and a crew of a kind of men, and a cloud of poison gas! What kind of men?"

"The sailors said the men in the plane were short and broad, with pasty faces. Muffled up in thick clothes and wore huge dark goggles. I tell you it's the biggest scoop the *Scoop* ever scooped!"

"Pity the Head's out, and I'm on the job," I grunted. "Rather he had the turning-down of you, Dick. If he were here—"

As the words left my lips the door swung open, and the Head himself stepped in.

"Whistle 'em up, Harding," he shouted. "Accelerate 'em. Not a minute to waste. Biggest boom of the century."

"Anything to do with freak airplanes and a new sort of men?" inquired Johnson, grinning.

The Head swung round savagely.

"How the deuce have you got wind of it? Yes, it has. A dozen airships, manned by queer-looking beings from the Lord knows where, have been located in a camp near Rio. They have killed a bunch of people with poison gas. It's official. Get busy!"

It was Dick's turn then, and he and the Head handed out some home-truths to the rest of us, as we got to work.

HERE again, is the scientifiction story par excellence. If you have been looking for a red-blooded hair-raiser, full of adventure, full of suspense, full of the most amazing and novel situations, and real science—you need look no further. "The World at Bay" contains all of these and more. In originality and sheer daring, this story stands in a class by itself, and will be appreciated and accorded praise by all of our readers, if we can judge by our past experience with their likes and dislikes. This story is one of the best we have ever printed.

I Get My Marching Orders

OUR extraordinary story was at first received with disbelief, more or less humorous; but, as the news dribbled in from South America, doubt gave place to the wildest speculations.

Of course, nobody knew whence came these new terrors of the air, but plenty of people pretended to know.

One clever daily proved to its own satisfaction that the airplanes were manned by Japanese, who were about to annex the southern continent.

There were rumors of a novel flying machine invented by a young Samuri of Nagasaki. Other equally reliable leaders of public opinion wrote of civilized savages from the depths of the Amazon forests, and even of invaders from another planet.

A tiny black tube was projected over the edge of the hull and a stream of vivid violet light came from it. It played upon us, and upon the squirming captives below. . . . Every muscle relaxed under the influence of that deadly, paralyzing ray of light . . . and we fell headlong to the bottom of the net, three more floundering bodies. . . .

"The real mystery," said Martin, "is this—that in these days of news and travel, any unknown race could exist—especially a race so advanced and yet so hostile to the rest of humanity."

There was no doubt about their hostility. No one was allowed to approach their camp near Rio. They killed or captured everyone who made the attempt.

A couple of bombing airplanes sent to investigate were brought crashing to the ground in broad daylight without any visible agency. The only survivor of the wreck spoke vaguely of being dazzled by a beam of pale light, and losing control of all his movements.

Twenty-four hours later the Head gave his orders.

"Better pack up your toothbrush and get, Harding. The Brazilians are going to attack in force shortly, and you might as well report on the affair at first hand. Take Martin with you. Even if it should all be over when you get there, you will be able to make a story out of it. The boat's a fast one, and leaves this afternoon." And the Head waved a fat hand grandiloquently. To send men to the ends of the earth with a word, to treat them as mere pawns in the great game of life—that was bliss to him.

As we steamed south we learned, per wireless, that two of the strange airplanes had left the Brazilian camp, flying eastward. Others had arrived from the south. A night attack on the camp had been repulsed with heavy loss. A day from Rio, we heard that shell fire had brought down one of the hostile air-vessels, and also that some of the latter had been seen near Capetown.

"All in the southern hemisphere, Max," said Dick. "What's that mean?"

"The only theory I've got is that they are German settlers in Brazil, who want to build up a great German World State in South America. They have invented a new poison gas and made a start."

"Only Germans haven't pasty white faces, and don't go about in heavy clothes in this climate."

"Then where have they come from?"

"From somewhere on the Antarctic Continent, Max. Where else is there any unmapped land big enough? Even after Amundsen's and Scott's discoveries, there is plenty of room there. And you have heard of the theory of some French naturalists—that there was a separate origin of life at each of the Poles."

"Supposing that some remnant of the original Southern Race has been all these centuries developing, unknown to us, on lines of progress quite different from ours? If such a race has learned to fly, why should they not wish to conquer the world for themselves?"

Dick's idea made me feel rather uneasy, though I scoffed at it. What if it should prove correct? What if the earth were to be over-run by men possessing such an awful weapon as their poison gas seemed to be? What if our armies and navies proved unable to cope with them?

If we had only known the truth—their real origin, the menace of their cold hostility—we should not have greeted so blithely the green-clad arms of Rio bay.

We entered that magnificent harbor, set in its fringe of hills and studded with emerald islands, early in the morning. Dawn had flung her mantle of glory over the lovely city, had lit the sea behind us with a gloss of glittering gold, made a shadow of Sugarloaf Mountain a cone of blackness on the water. The white houses rising out of the foliage caught the sun's rays horizontally, standing out like clear-cut cameos.

Beyond the denser zone, where the villas were more spread out, a mistiness, a fog, a vapor, seemed to be fighting back the light of day.

The waters of the bay were alive with craft of all sorts and sizes, all hurrying seawards.

"Good God!" cried Dick, clutching my arm. "It's all true! They are attacking the city now!"

The terrible sight that he pointed out with shaking finger robbed me of words.

A great cloud of smoke was now rolling down the hills, rolling to the sea, driven before a gentle land breeze. It was a slowly moving mass of smoke-black mist.

Fascinated, we watched its silent progress as it drifted down the slopes towards the indented shore, blotting out the city, avenue by avenue, street by street.

The magnificent Palace of San Christoval stood out for a time, gleaming in sunlight as the advancing tendrils of the mist crept round it. The Church of Our Glorious Lady also rose above that dead sea—for a time. Then they were smothered and engulfed, and were gone. Down the hills, filling up the valleys, through the dense city to the very shore, came the rolling fog. From somewhere inland came the crackle of gun fire and rifle fire, and the bang of shells, but these sounds of action quickly ceased.

Crowds lined the Great Promenade. Masses of men, women and children, white, brown, black, came pouring down the streets leading to the shore; and behind them, in steady pursuit, the gloomy cloud. Behind the cloud all was silence.

"Is it a nightmare, Dick?" I cried. "Are we dreaming this horror?"

For answer came a raucous voice roaring through a megaphone. The skipper of a tramp was hailing us.

"Beat it! Clear out! Slew her round, Boss!" he roared. "The cursed brutes are poisoning the whole shebang. Beat it! Get!"

The voice trailed away to silence as the tramp, her funnels pouring out thick volumes of vile smoke, worked out seaward.

Our captain and pilot looked at each other. The first-class passengers, alarmed, clamorous, crowded near the bridge.

Was there any danger! Would it be safe to land? What was happening? What ought to be done?

And while we chattered and shouted and questioned helplessly, the men in authority consulted in low tones. Were we to go on, face it, or should we show our heels?

The City of Silence

THE suspense did not last long, for the peril facing us was too real. The screw slowed, we swung round, and turned back with the fleeing tide of shipping. We fouled another vessel as we turned, and ran down a fishing boat.

The black cloud, meantime, was rolling nearer and nearer. Down to the water edge it came, flowing out over the sea. As it passed over the few remaining boats at the quays, the hubbub of human cries abruptly ceased. The cloud smote them into stillness and came billowing on in soft smoke waves, now fifty yards out from shore.

And then, as we watched, fascinated, appalled, the vapor slowly but visibly thinned, became filmy, transparent, fading away into the air. A vivid, intermittent stream of ghostly sparks had traversed the cloud—a stream of sparks coming from a point among the distant hills. The welcome sight roused me from the unworthy stupor of fear, and steadied my brain.

"Where are you taking us, Captain?" I asked. "I booked to Rio, and at Rio I land."

"Are you mad, Mr. Harding? Did you come all this way to commit suicide? I shall certainly not go into port here. Wait till we get up to Campos; I'll land you there. I've the ship and all the other passengers to consider."

"All the same, I'm going ashore now," I said. "It's business—orders—no getting away from it."

"Nothing doing," he said grimly.

"Captain," struck in Martin, "just get this fact; we are going ashore, if we have to swim for it. The poison cloud is drifting away already. For all we really know, these people may just have been stupefied—they may all recover presently."

"Of course, being reporters—" returned the skipper with withering sarcasm. "Anyhow, it's your own funeral. If you care to buy one of our old boats—by a miracle, we carry more than we need—you can go. Only when you're dead, don't write home to your news-rag and blame me."

So we had our way, and the boat we bought sufficed to land us near Da Gloria Point.

A few adventurous spirits among the passengers were keen to join us, but we declined their company. We were taking risks for business only.

A grim spectacle awaited us where we landed. Shrunken bodies were lying in all sorts of attitudes—just as they had been stricken down. The gas-cloud, though thinning, still hung like a pall over much of the city. The ghostly sparks no longer glittered, and everything was uncannily quiet.

"Come along," I said, seeing Dick fumbling in his pockets. "We shall get some good copy, anyhow," I added with a shiver.

"I've brought a couple of gas-masks along," he said. "Believed in this business from the first, y'know. And here's a little tube of oxygen; I've got another. Never know what may happen."

Thus equipped, we began our exploration of the city that lay so still under the hot sun. It was the silence that got on our nerves first, even more than the passive bodies in the streets and shops.

We had both been in France, remember. The bang of guns, the riot of bursting shells, would have made us feel at home. Here there was no sound at all.

There was no sign of the beings who had wrought this havoc. Not a single airplane disturbed the serenity of the clearing sky, as we penetrated into that city of the dead.

The memory of it is fading, mercifully, or the full recollection of the ghastly horrors of that walk would rob life of all its joy. Men, women, children, Brazilian, Spanish, Negro, Indian, German, lay about the streets as the gas had overtaken them—some on the pavement, some on the roadway, some in shops and houses, some in the tram-cars. An auto, with five lifeless forms sprawling upon its cushions, stood half in, half out of the plate glass window of a fashionable store.

Death—for death it was, without the shadow of a doubt—had been sudden. The prevalent expression on all faces was that of frightened surprise. And every one of these quiet thousands was shrunken and shriveled to a skin-clothed skeleton. It was as though the gas had withered them internally.

In less than an hour we had had enough and turned back towards the shore. There was nothing to do, no one to help. Some outlying parts of the city might have escaped, but as a few coils of the gas still lingered to landward, prudence urged retreat.

Five minutes after turning back, we met the first live man. He came lurching out of a saloon, half-drunk still—an Englishman, a typical Cockney.

"'As it gorn?" he asked. "Strike me pink if I stop in this hole another bloomin' day. Where did you pick up your masks, chummies?"

"How did you escape?" snarled Dick. Dick has no use for a boozer.

"Sees the bloomin' cloud coming erlong, just like one of the old London forgs," explained the man. "The Dagoes screamed like 'ell, and shouted that the flyin' devils was going to smother us all. So I waltzes inside 'ere while they all run for shore, I jumps into the cellar, bangs and bolts the door, jams the keyhole with me 'ankercher, and samples the swipes they drink down here. I drinks and waits, the row above stops dead; I waits and goes on drinkin'. Then I 'ears you talkin', and comes out. Gawd! Mean to say they're all dead?"

"It's a city of the dead," said I. "Come along with us."

"Show you a short cut out to the country," hiccoughed the man. "I've 'eard things; I'll show you."

We looked at each other, and then, the tipsy Cockney staggering between us, we turned about and made our way inland, anxious to leave that charnel city behind us. Feeling safer now, we took off our gas-masks.

But it had not done with us yet. Passing a smart confectionery shop, seemingly empty, it occurred to me to appropriate food and drink. I pushed open the swing door, had one terrible glimpse of the bodies on the floor, among the chairs and little tables, and then a wisp of the foul poison vapor, floating to the open air, struck me in the face.

I gasped for breath, heard a sudden cry cut short, stumbled forward, and fell down into the blackness of oblivion.

The Battle

WHEN I came to myself, I was sitting up on the pavement just outside the cafe. A queer odor hung about and my two companions were grinning with sudden relief. Dick was screwing on the top of a little metal tube, which he then stowed away in a vest pocket.

"Just a whiff of oxygen, old scout," said he. "Good thing I brought it along with me. You would have been a goner if we hadn't given you a dose instanter."

"Gev me a turn, matey. Thought you was travelin' west."

The shock, added to action and fresh air, was rapidly sobering Harris, our Cockney friend. Although feeling shaken and nervy, with great soreness about the throat, I was quite able to get up and walk, and we lost no time in resuming our march.

We went with masks held ready for use, and kept our eyes skinned for every lurking shadow or patch of darkness. Harris talked incessantly.

It seemed that the Brazilians had been slow to act at first, and only sent a few air scouts to investigate the hidden lair of the newcomers. These were quickly put out of action by gas bombs fired from an almost noiseless gun. Further attacks had all failed in the same way, succeeding only in irritating the strangers. The awful slaughter in the city was their answer.

"But they're goin' to be wiped out, me lads," said Harris. "I ain't been long in this rummy 'ole, but I made a few pals. Came across a Dago who'd been in France. 'E's in the army, and 'e told me only larst night how they was agoin' to give the blighters 'ell. They're shifty coves—keeps movin' their camp. The Dagoes has therefore planted a few camerflarged heavy guns nice and handy around their last place—and when they starts to flit—blimy! it'll be like a dream of the fireworks we used to have round Wipers."

His adjectives grew hotter. He swore—to keep his courage up. We didn't like him, but if he had a friend in the army, he would be useful, so we went along with him.

We came out of the death zone at last, out into the open country, and were received with cordiality and eager questioning by the people we met. We found ourselves, as the first persons to come out alive, quite important, and it was not long before we got in touch with the army, and were in possession of permits to visit the military zone inland.

We sent off our first message to the *Scoop* by an officer of engineers who was on his way back to the city to get the telegraph cables and wireless station to work again. Then we went forward to the front lines, where we were told all was in readiness to annihilate the enemy, when they moved to the new camp, which they had begun to construct in a hollow of the hills.

The smart Brazilian officers assured us, as they smoked innumerable cigarettes, that the end was only a question of stern patience. They had every surrounding landmark "tapped," and the invaders, whoever they were, would simply fly into a death-trap as soon as they showed themselves. The country was parked with guns, and when they were brought down, the mystery of the origin of the strangers would be solved.

So talked the soldiers, eager to avenge their beloved city. We waited two days, and then—then we knew that the peril would not pass so readily—then we began to realize the danger that threatened the world.

It was early in the morning of the third day that the cloud of black dots suddenly appeared in the sky to westward. Bugles rang out, the gunners sprang to their guns, all that hidden army of men in concealed trenches waited for orders.

"Here they come! Six, ten, twelve, twenty of them!" cried Dick. "Why not pot them now?"

We were lying in the high grass, to rear of a masked battery.

"Waitin' to get 'em at close range, and make sure. You'll see fireworks d'reckly!" said Harris.

We had brought good field glasses, and, as the airplanes approached, we could see that they were queer, box-like structures, with screws fore and aft, and rising and falling wings. Underneath each machine, swinging loosely from four cables, was a curious lattice-work cage.

Came the tinkle of a telephone bell, and our battery roared out its breath of flame. The air seemed full of sound, and the white puffs of the bursting shells dotted the sky.

"Fine! We've winged a couple—no, three of 'em!" I shouted. "Now for another round!"

Another round was fired, but this time without result. The air was filled with bursting shells, but the enemy had risen above them. Their vessels seemed to leap upwards, and from each of the uninjured ones came a tiny report, like the plop of a popgun. From each of them came something that struck the ground, burst with a dull, muffled bang, and became a rapidly expanding cloud of thick billowy vapor. One fell near us.

"The poison gas!" cried Dick. "No time to get masks on. Run! Get into some hole!"

We started, looking for a hollow, but the cloud was swelling out faster than any man could go. Out of the tail of my eye, as we plunged along, I glanced at the gunners, standing grim and silent at their posts, awaiting another word of command. The gas was rolling along the ground like a liquid. I saw it reach the horses tethered near the guns. They neighed, shivered, and fell down, dead and blackened, as the cloud passed over them.

It was close on our heels. Just ahead of its advancing billows, we dropped into a deep hole near a watercourse. We sank deeply into soft, damp earth, and drew pieces of turf and clumps of bush down to cover us.

A piece of loose soil gave way and almost buried us as we fumbled for our gas masks feverishly. Struggling, hampered, frantic, we expected every moment to be our last—every moment we expected the deadly folds of that black cloud to envelop us.

The Fate of the Refugees

WE waited for death—and it didn't come. We breathed; we lived. We were conscious, even in the dreadful suspense, even in that smothering hole, of a great silence above. No sound of guns, or burst of shells, or drone of airplanes, or echo of a human voice, came down to us there. It was as though we were deaf. It was as awful as the silence of the dead city by the sea.

How long we waited I can't tell. It was thousands of years, perhaps. And then came a vivid flare of light, the rolling crash of thunder, a deluge of rain, and a fierce gale that whistled shrilly through the long grass.

Tearing off my ill-adjusted, vile-smelling gas-mask, I stood up.

"I'm for the fresh air!" I shouted.

"Same here," said Dick, and we scrambled out of the hole into the free, open sunlight that shone between the thunder clouds and sparkled on the drenching rain.

The storm had saved us. The gale had torn a pathway through the poison cloud and the rain was dispersing it. We stood in a sort of clear land of rain-washed atmosphere. Not an airplane was to be seen.

"Wonder whether the Dagoes got 'em all?" mused Dick. "And I say, old man, where's our Cockney friend?"

We had reached the nearest hidden battery by now, and I pointed to the silent tube screened under the bushes. A crumpled, shriveled form lay under the carriage—our London acquaintance, whom we had completely forgotten in our own panicky flight. And round the gun lay every man and horse—dead.

"There's the answer to your questions, old man," said I. "The fiends have simply poisoned everybody and everything, and cleared away. We are the only survivors, as we should find if we hunted up all the batteries. That hole and the storm saved us by a lucky chance. And my advice now is—get away north to the river and get some sort of boat and clear out. This country is damned."

"The wisdom of Solomon," answered Martin, the irrespressible. "I should think so, indeed. It's a good thing we are journalists and take all this in the day's work."

There's no need to go into detail about our trek over that stricken country; no need to tell you how we wore our boots out, got lost, went hungry and secured food; how we hid from sight whenever an enemy airplane went swishing overhead; how we got over the mountains at last, and, dog-tired, in rags, but hopeful still, reached a rotten little wharf on the Parahyba River.

"If we're still in luck, we shall get a lift from here down to S. Joao de Praia," said Dick. "And from there by sea somewhere else. And I think we are in luck. That looks like the smoke of a steamer over the trees, and there's a considerable racket going on. Another sprint and we'll make it."

We made the wharf, saw the steamer, and our hearts sank.

"An old stern-paddler—junk when Columbus sailed!" I groaned. "A wood-burner, with boilers about to burst. And full-chock full of yelling Dagoes!"

On the rotting wharf, struggling, surging, fighting to gain the gangway that the few sailors were trying to cast off, was a crowd of at least two hundred.

"Come on into the jamboree, old scout," shouted Dick. "Our only chance, if we don't want to be stranded here. Come on!"

We dashed into the yelling mob, and joined in the fray. Civilization had worn thin on us those last few days. We reached the gangway—which was already loosened, and swaying—as a sharp, whip-like report rang out.

The man in front of me threw up his arms and fell sideways, slipped under the chain and splashed down into the muddy river.

"Any more for the same?" roared the captain of the rickety old tub. "Lower away there."

The gangway gave a sickening lurch as the paddle began to churn the water. Still the frantic mob pressed on, and we were pushed forward willy-nilly. A woman with torn dress, blazing eyes, her face pale yet determined, was thrust into my arms.

I should not have noticed her, in the fierce frenzy of that moment, but she panted jerkily:

"Mr. Harding!"

I turned, clutching my friend by the arm.

"Rita Courtney, by all the gods, Dick! We've simply got to go aboard now!"

The gangway hung by a few inches on the tilting deck. We pushed across, laid hands on the ship's rail, Rita between us. Women screamed, men swore and kicked, and flourished knives. Even in the dense mass of people that packed the deck, there seemed a slight inward pressure, as though to make room for just a few more.

The angry skipper—a lean fellow countryman—lifted his revolver again.

"Any more for the same?" he repeated. "Stand back there! Sheer off!"

We made a last supreme effort, we three, and, as the vessel moved, felt the gangway drop from under our feet. The skipper's gun barked, something sang past my left ear, and with a wild scramble, we were aboard, groveling in a heap on the dirty deck.

With a hoarse curse, the captain threw down his gun in furious resignation. The creaky tub, low down in the brown water, churned her way out towards mid-steam slowly, smothering us with a reek of acrid wood smoke.

From the wretches left on the wharf came howls of rage and despair, that suddenly rose to a crescendo of pandemonium.

"And no wonder," said Rita Courtney. "Look there! One of the strange airplanes, coming fast, swooping low!"

And as she spoke, the old tub, overloaded with her swarming human cargo, lurched heavily, ran into a mudbank, and there wedged herself fast.

We Are Taken Prisoners

IN a moment the vessel became an inferno. Everyone seemed to go mad. The skipper roared orders that no one obeyed.

In spite of vigorous churning of the paddles in the mud, we stuck. The crew rushed up from below, the passengers fought them for the two boats, and scores leaped overboard. Murder was done, and some of the murderers, in the first boat that got away, met their punishment early. Overweighted, the leaky craft capsized, and the snouts of a couple of caymans—the South American alligator—quickly appeared.

Protecting Rita from the sight as best we could, we remained on the top deck forward, watching the nearing airplane. It was close, flying low.

As it passed over the crowd, already scattering in all directions from the landing-stage, we saw that it was trailing a kind of coarse-meshed drag-net along the ground, the meshes of which glittered like silver in the sun. Caught in the net, many of the scared folk were picked up. They were netted as men net fish.

"Horrible!" cried Rita. "Whatever do they want to take people alive for? See, they are dragging them up into the big cage that hangs loosely underneath their vessel!"

"Yes, and, worse still, they are now making for us, and letting the net down again," said I. "Looks as if they wanted to bag the lot of us!"

"Let them come, that's all!" shouted Dick eagerly. "If we can only get to close quarters, they won't be able to use their poison gas, and we can account for a few of them."

He rushed off to try to get the skipper's aid, and he, with two or three men who hadn't quite lost their wits, stood by for the fray. If we could only get hold of that net, make it fast, and use it as a ladder to climb up into the strange craft—

If only we could capture this strange vessel, how different might have been the history of the world afterwards!

The swinging metallic net came nearer and nearer, lower and lower. We could now see the airplane clearly, could note the slightly undulating wings, the humming screws. Over the edge of the box-like hull protruded several round heads, peering down at us through huge dark goggles.

I wonder that no one in our excited crowd fired up at the grotesque heads, but we were all, in truth, in the grip of fascinated terror. Lower, nearer, and the front of the open net touched our deck. With chains, ropes, hooks, we fell upon it, lashing and fastening it down to stanchions, rails, and ring bolts. The slack of it passed over and hung astern, a glittering tangle of confusion, in which, with piteous cries, the people who had been picked off the wharf struggled helplessly.

We raised a cheer, and, led by the skipper and our three selves, we began to climb up the coarse meshes towards the airplane. Grunts and cries came from the staring heads above, and a yelp of rage as some one fired pointblank upwards. What looked like a squat bundle of rags pitched out and fell overboard among the caymans.

"One to us!" cried Rita.

Even in that frantic moment I found time to glance into the girl's clear grey eyes and to thank God that she was the bravest and coolest woman I had ever known. We were not prepared for what followed. We did not then know what diabolical devices these strange beings had at their command.

The airplane suddenly leaped into the air. It rose vertically, with a tremendous roaring effort. The net righted, tore itself free, tore out of all the bolts and fastenings, snapping our cords and chains like cotton.

The jerk threw the steamer over on her broadside, the crew slithering down the sloping deck into the river mud. Most of those who were climbing up were shaken off, but we three managed to keep our footing, hanging on by feet and hands and teeth.

It was an awful experience, hanging there in the open network, swinging to and fro, as the strange craft shot upwards.

Looking down, the sinking river steamer, with wriggling black dots upon and around her, seemed like a child's toy. At the bottom of the net still tumbled and struggled the dozen or so victims caught ashore.

"What next?" cried Dick. "We can't hang on here forever. And I don't fancy going down into that bunch."

"Excelsior!" cried Rita. "Let's go on and get to close quarters."

It was not to be. A tiny black tube was projected over the edge of the hull, and a stream of vivid violet light came from it. It played upon us, and upon the squirming captives below. Their outcries ceased, and as for ourselves—

I only know that it seemed as if all will and volition had left me. I did not lose consciousness, but every nerve and muscle relaxed under the influence of that deadly, paralyzing ray of light.

We fell headlong to the bottom of the net, three more floundering bodies added to the floundering, struggling mass.

Then the net began to rise, drawn up from one side. I thought grimly of the fish I had seen hauled up and emptied out on the deck of a North Sea trawler. We were the "catch" this time. What was to be our fate? For what purpose were these mysterious, inexplicable people making us prisoners?

The Mystery Deepens

HELPLESS, quiescent, save for the uncontrolable and spasmodic movements of our limbs, we rolled over and over as the net rose.

Still bathed in the ghostly glow of the strange, paralyzing radiance, we saw one side of the great cage of metal bars swing down.

A final jerk, and we were all flung pell-mell into the cage. The net fell away, the cage door clanged shut, and the violet light was switched off. We rose dizzily to our feet, shaken and trembling.

"What next?" said Dick, in a husky voice. "What are they going to do with us? They seem to be in-

fernally clever and scientific. This machine of theirs is a genuine helicopter—it jumped away from the old tub down in the mud there. I wonder—you never know what these scientific beggars will do in cold blood!"

"Don't, Mr. Martin," said Rita, shuddering. "Don't say it. If the worst comes to the worst, we must face it bravely; but till it comes, let us 'carry on.' Besides, what wonderful luck for three daring journalists! Here we are, *en route*—for we are moving now—for the headquarters of these strange enemies of humanity. We shall see them at close quarters, find out all about them, and then escape with our news!"

She laughed bravely, though there was a hint of tears in her beautiful eyes, and, putting out her slim, cool hands, she gripped ours nervously.

It was in that moment, for the first time since I had known Rita Courtney, that I felt something fresh, something strange, in our friendship.

I had always admired her, in spite of my old-fashioned ideas on woman's true sphere of life. In that moment I knew, "beyond a peradventure," that I should always look upon her with different eyes.

We were now traveling fast to the southward, and though in the tropical belt, the wind that tore through the open cage was icy cold, chilling us to the bone. We huddled together for warmth, and tried by our example to calm the fears of our fellow-victims.

Soon we lost sight of the river, and leaving the hills near Rio on our left hand, swerved westward.

"Going, I should guess, at least 150 per hour," said Dick. "Making for the depths of the great Amazon jungle, if they keep on this curve. Thousands of square miles of unexplored and impossible forest there, you know. What a story—if ever we get back!"

If ever we get back!

For a couple of hours, the vessel continued her steady flight, her screws and unseen engines working with a ceaseless, changeless, droning noise.

At the end of two hours, the ship came to land in a clearing of the forest, where two other machines rested. In this camp, within a stockade, were about fifty more prisoners. Our captors herded us together, turned on the paralyzing light, and two of them solemnly examined us.

It was a maddening experience. Helpless, inert, capable only of seeing, understanding, fearing, we were passed in review like so many cattle, so much livestock. They prodded us, turned us over, emptied our pockets, annexed our revolvers, knives and watches, and finally sorted us into two lots.

We three, fortunately, were left together in the section that seemed to give our captors most satisfaction. The other section, with the violet ray cut off, were driven out of the stockade, out of the camp and into the jungle. When we were freed from the paralysis of our fear, we were given a good meal of native bread with water to drink.

When night came, we were still prisoners, and had given up all hope of immediate escape.

"Have you any idea why we have been kept here and the others weeded out?" asked Rita. "Never mind me, tell me exactly what you think, Mr. Harding."

"I can see only one indication of what determined their choice," said I. "Those of us who are left are of different races, of both sexes, some tall, some short; but—but—we are all healthy-looking, well built, strong."

"Looks as if they were keeping us to breed a race of slave-workers—or else they're cannibals," blurted out Dick. "Yet they were eating fruits and nuts just now. I give up the riddle; it's hopeless."

It certainly seemed hopeless to gather even from keen observation of these strange beings at close quarters, who they were and whence they had come. They certainly did not feed like cannibals; they did not appear to eat meat of any kind.

They were squat and coarse-looking, but their eyes—as we saw when one removed his huge goggles—were large, luminous, and intelligently cunning. They were clad in many heavy wrappings of dark material, as though even in this hot climate they were cold.

I leave you to guess our anxieties and discomforts during the next day and night, herded together as we were, forty of us, in an open space, exposed to the tropic sun, tormented by flies and mosquitoes, and ever dreading the attack of termite ants.

It was with relief, then, that we welcomed symptoms of activity the following morning. By signs we were told to re-enter the cage under the airship that had brought us, and since there was no help for it, we meekly obeyed.

The vessel rose, turned north-westward, and, after a long flight over miles and miles of steaming jungle, spread out beneath us like a vast green sea, we saw that we were approaching an area of blackness, an irregular circle torn out of the forest. It was like a huge wound in the velvety green sea.

The airplane slowed, but did not descend until we were over the center of this great pit or crater, and then stopped.

"A volcanic outburst!" said Rita, as we stared together down into the great gulf below. "It must have been an enormous eruption. There are miles of stones and ashes and blackened timber around it. And see! Parts of the pit are smoking yet, though in the middle it is quite black. And—oh!—let me hold your arm, Mr. Harding—we are falling, falling!"

We clutched each other nervously. The floor of the cage seemed to be dropping from under our feet. The dense black center of the plumbless pit appeared to be rushing upwards to swallow us in its black and smoking heart.

The airplane was falling like a stone.

Into the Underworld

FALLING—falling—into the black core of that great wound in the ocean of green forest.

We clutched one another fast, we three; and from Rita's clear eyes flashed a message to mine. It said, as plainly as spoken speech:

"Be brave, friend. Let us be glad that we are together, even if the worst comes."

For already I knew that I had won the friendship

and esteem of this great woman. To have won even so much, it seemed to me, in that moment of helpless fear, was well worth having lived for.

Down—down—down into the dark pit. The rough, ragged edges of the vast hole rose up and were around us; we were dropping down a wide well of increasing shadow.

And then, as suddenly as that descent had begun, it stopped. The floor of our cage once more felt solid under our feet, the screws of the vessel began to throb.

"We are going down slowly, under control," said Dick. "These chaps are clever. Wonder what there is at the bottom? Must be a deucedly deep mine."

After a slow fall that seemed to last for ages, the darkness grew to a dim twilight, and just as the receding walls of the rough shaft vanished out of sight into the somber shadows of a monstrous cavern, the airplane came to rest on the rocky floor.

The light, which was phosphorescent, and seemed not to come from any visible source, but to pulse through the very air in waves of varied intensity, grew and grew, until we were able to see the contours of objects around us.

The cave was full of active life; groups of the strange folk were hurrying about, a number of air-vessels, similar to our own, were at rest near the bottom of the great shaft. Looking upwards, as we stepped out of our opened cage, we saw what appeared to be a bright, white star in the rocky firmament. It was the light of day.

"I think we have come down deeper into the earth than any mine that was ever sunk," said Rita. "Miles down, I believe. And these people may be dwellers in an underworld of which we on the earth's crust have had no previous knowledge."

"But why aren't we boiled and roasted, Miss Courtney? You know very well that the heat increases rapidly as we dig into the earth, and that in the very deepest mines work is almost impossible."

"Of course, Mr. Martin, I can't answer you. It is all amazing. I happened to notice the time by my wrist watch when we began to fall, and I looked at it just now. It is four and a half minutes ago. Work it out; I'm too lazy. The distance fallen must be enormous. Look at these great openings all around us, receding into infinity, apparently. The floor goes down, down everywhere; the roof can scarcely be seen.

"Look at the people—if one is to call them people. Down here, where it is very warm, as you must admit, they have discarded their thick clothes and dark goggles, which, I am sure, they only wore above ground to protect themselves from the chill and sunshine of our world. They move about here, in this funny wavering, 'all-over' sort of flickering glow, as if they were at home."

And very queer objects the creatures seemed on closer inspection. They were short and squat, ungainly of limb, long-armed like apes, and ghastly pale of skin, as though wilted and bleached by the hot, humid air. They wore no head-coverings on their short, fuzzy mops of brownish hair. One rough, coarse, ill-fitting robe of dark material, reaching to the knees, and a sort of sandals on the feet, completed their wardrobe. Indeed, their climate, warm and equable, made anything more needless.

As to the sexes, they appeared to dress exactly alike, and one could only distinguish them by the softer, more curving contour of the bare limbs, and that "something different" in the eyes that baffles all analysis of words.

They looked what they were—creatures of darkness, born in everlasting gloom, and yet creatures somehow akin to humanity.

"If Miss Courtney's amazing theory is correct," said I, "that hole up there which looked like the result of a terrific explosion, was, in fact, just that. These Troglodytes have bored and burst their way out and into our world."

"Certainly looks like it, old man," Dick grunted. "But you two run on so fast. It's rather a big idea to get into one's head. One wants more detail, more information."

"Which one and all of us seem likely to get pretty soon," said Rita. "This is where we 'move on,' where we begin to have some idea what they have captured us for." As she spoke, a squat figure approached and pointed at us the black metal tube he carried, and then onwards towards a gaping dim cavern on the right.

"That means march, and don't stop to argue!" I said. "He has a paralysis gun there, and if we don't go without, we shall go with it."

Our motley band of dazed and scared humans accepted my lead, and, preceded by some and followed by others of the gnomes, we tramped wearily into the fluctuating lights and shadows of one of the vast corridors of that astounding underworld.

"We mustn't lose heart; we mustn't lose our wits," said Rita. "It may be that we shall find out how and where they make their poison gas. We may be able to escape, or we may at the least be able to destroy their works."

That was Rita. She never studied herself, never admitted impossibilities; she would be game to the end, would never lose hope while life remained. Her words inspired us, but they also brought home to us the strange facts of our horrible position.

Here we were, miles below the surface, being driven along a shadowy tunnel by a squad of creatures, scarcely human, towards a fate of which we knew nothing. No wonder some of our party whimpered as they stumbled along, while others cursed.

The cavern widened as we went on, its floor ever descending, its roof already lost in gloom. From somewhere out of the darkness a stream of running water came alongside—a stream that ran with an eerie gurgling, and whose ripples were lit with a phosporescent glow. It ran our way, and presently we came to a barge, upon which we embarked.

There was a motor of some kind at the stern, and under its power we went downwards and onwards through the pulsating light.

At last we seemed to have come into another world.

Walls and roof had vanished, and our boat was crossing the glowing waters of a seemingly shoreless sea. But right ahead was a curious red glow, that broadened and reddened as we neared. A grey cloud of fitfully lit smoke hung over it. A murmur of sound, that grew to a clamor, a roar, a grating discord of noise, struck upon our ears.

And then Something came out of the red-lit smoke bank and swept down towards our boat. Something that flapped noisily, like a monstrous bird of prey. From beneath it trailed a mesh of glittering metal.

"Another airplane with a net for us!" cried Dick. "O Lord, how long?"

The net fell alongside. We were bidden, by signs, to jump in. There was nothing to do but obey.

The Republic of the Slaves

IF ever there was a nightmare journey, that second flight through the semi-darkness was the worst nightmare of all. Once we were meshed in the net—about thirty of us now—the airplane continued her motion.

They did not trouble to put us into a cage, but let us hang there, swinging to and fro, as the vessel, flying very low, winged her way along the shadowy corridors and twisting tunnels of the underworld.

Down, still down, we went, now following running water, now traversing long passages where the only sound was the hum of the vessel's machinery and the reverberating echo that followed us continually. Now and then came flashes of a stronger light from some side opening, or in a wider space; sometimes, as we swung and twirled in the net, we caught glimpses of great rough columns of unhewn rock—the granite props and pillars of this labyrinth, this honeycombed nether universe.

We were now past speech; words had failed us.

At last the machine stopped, hovering just above ground in a hall of huge dimensions. We had just time to note that this great space was fairly well lit, had a stream running around it in a wide loop, and was dotted with moving figures and a cluster of huts, when the net was opened and we were incontinently spilled out, pell-mell

It was awkward, ignominious, but no bones were broken. We stretched our cramped limbs and looked about us. One of the gnomes clambered down out of the machine, and, coming to each one of us in turn, touched us on the head, one by one, each time giving a queer sort of double grunt.

"Our names down here!" cried Rita, repeating the sounds as she touched each of us.

It was a flash of inspiration. The strange being wrinkled up his pasty face in a palpable grin of satisfaction, and went over us all again. We imitated the sounds in each case as well as we could, and his satisfaction deepened.

Then he clambered back, and the airplane vanished into the shadows.

"And here we are—and where are we?" said Dick.

"Better ask some of the people here," remarked Rita, thoughtfully. "They are human, at any rate. Prisoners brought here as we were, I fear."

There were hundreds of them, but only a group of four persons appeared to have taken any interest in our arrival. These four were fellow countrymen, we saw at once, and their dress had evidently been expensive in material and cut, though they were as ragged and soiled and disheveled as ourselves.

The foremost—a tall man—lifted a battered hat as he advanced, and Rita suddenly ran forward with a glad little cry of surprise and welcome.

"John!" she said.

"Rita!" he cried. "You here? What bad or good fortune brought you?"

"Duty, business, John. The same as yours, I expect. Mr. Harding, Mr. Martin, let me introduce my dear friend, John Rixon. You've read lots of his articles. He's 'Arcturus' of the *Mercury;* but few people know it."

Dick greeted the big man genially enough, but I am afraid I was lacking in genuine warmth. He was Rita's "dear friend." She called him "John"; I was only "Mr. Harding." And even down there, among the captives marooned in that twilight cavern, one could not but sense the man's force of character, his fascinating personality, his cheery optimism, his charm.

My heart, unreasonably, became as heavy as lead.

"I'm afraid I can't claim that I'm here all in the day's work, friends," he replied. "Fact is, I was on holiday up country from Rio when these beggars first burst out from under, and I was in one of their earliest 'bags.' They yanked me and a few more down here, and have been bringing extra comrades every day since.

"I never expected to see you, Rita. Tell me how you were caught—I hope the fiends haven't penetrated far yet! And then I'll introduce you to a few friends of mine who are bossing our little Slave Republic."

"It's a long story, John. Briefly, we came out after copy. These friends of mine were in time to see nearly all Rio wiped out by poison gas, ran across me in their subsequent travels, and we were captured together. As far as we know, these Troglodytes haven't yet been seen north of the equator.

"And now tell us what you mean by your Slave Republic. How many prisoners are there? What do they want us for?"

A very queer expression passed John Rixon's strong face.

"I'll answer your last question first," he said. "They want us—they need us—to work. That's why we call ourselves the Slaves. There are about seven or eight hundred of us here in camp—at present. There have been more, a lot more . . . "Many nationalities; quite half of us are brown or black. A party of us decided to run this show on some sort of basis of law and order. Oh, we have quite satisfied ourselves that there is no way out. We have a sort of government—I'm President, as it happens—police, commissariat, news service, medical service, sanitation, and so forth. The idea is to keep people occupied, not to let them think too much.

"What do we eat, eh? Well, M., there you touch a tender spot. The water is fairly good to drink, though never cool and refreshing. Some food is brought down from the upper world with every 'bag' of new slaves; our staff of life is a vile concoction these beggars eat themselves—a sort of black, sticky, jaw-aching stuff that I believe is really chemical food—a manufactured article. It disagrees with all of us, more or less. But, of course, that doesn't matter much . . ."

HE stopped abruptly, as though he had said more than he intended, and his face wore a grim look.

"John," said Rita, firmly, looking him straight in the eyes, "why doesn't it matter about the food? What is this 'work' that they want us for? Tell us the worst at once."

John Rixon looked uncomfortable, and turned appealingly to Dick and myself.

"Don't take my friends aside and whisper to them; don't tell them that you want to keep the horrid truth from me as long as you can," said Rita, sternly. "I'm here and I want to know. I must know."

"Perhaps you are right, after all. There isn't a braver woman breathing, I believe. Well, the fact is they need forced labour to do their dangerous and unhealthy work. Farther on, miles deeper down, there are great mines, rich in many wonderful substances. The heat, of course, is terrific, but not nearly as much as the theory of a central glowing nucleus to the earth supposes. It is in these deep mines that we are to work. Almost as fast as prisoners are brought from the upper world, some of us are sent below. They pick us out at random, and we can only wait."

"That's why they sorted us out in the jungle," said Dick. "They only make permanent prisoners of the strong and able-bodied. But what a fate!"

"Have you seen any of the mine-workers?"

"I have Rita. Out of the two hundred who have been taken away from us since I came here, three persons have returned. They died within a few hours."

"But no doubt they told you something about the work?" I asked.

"They did, Mr. Harding."

Rixon spoke slowly, as though every word were being dragged from him. Rita gave him no quarter.

"What did they tell you? What sort of mines are these? What do they bring out of them?"

"There are two great working galleries, I understand, at different levels. The upper mines are where they dig out the material from which is manufactured the poison gas. The crude ore itself is poisonous to the touch, and shrivels up every worker to a living—and then to a dying—skeleton within a few months. I gather that these upper mines have previously been worked by criminals. From what one of our fellows told me, it seems probable that there has been a lot of trouble and fighting amongst these underground folks, and the losers in their wars have had to do slave work for the victors. But the supply has run short, and this is where we come in."

"I see," said Rita. "Driven by necessity, they have burst a way up into our outer world to find a new supply of slaves. And what a supply they will have if they conquer! It's awful, horrible!"

"It makes it worse still to think that we have to die down here in working to help conquer the world," said Dick. "If we must die, in any case, why can't we all go on hunger-strike—just lie down and die without working?"

"We tried that," replied Rixon. "It was the logical thing to do. But we couldn't carry it out. Many of our people hadn't the stamina. And when it came to being paralyzed and—yes, I may as well tell you—a few of us were tortured, we gave up that game. We can only make the best of our position, keep busy and sane as long as possible, and hope for the best."

"And what about the deepest mines of all? You haven't told us about them. You are still keeping something back, John?"

"Have you noticed the motors on their airplanes—the motor on the boat that brought you down the stream?" was Rixon's response. "Did you see what small engines they are, what little space they have for storing fuel, and yet how powerful they are? They are simply radium engines. Deep down in the earth, these underground dwellers have discovered radio-active substances in bulk, and have learned how to use them.

"Those deep mines, where any day any of us may be taken to work, are radium mines. Now do you wonder they require slaves?"

A horrified silence fell upon us.

Radium mines—where the rocks were emitting invisible and harmful emanations; where bodies would rot and waste away. Intrepid scientists, using only minute quantities of radium, have died painful deaths in consequence. And in these deep mines where we must work, this strange and terrible material would be the very stuff we should delve for!

Live! It would be life worse than death. Rixon roused us from our stupor of terror.

"Come along," he said sharply. "You insisted on knowing, and now your curiosity is satisfied, you must learn your places here, and find out how you can help me in keeping order and sanity. First, I'll introduce you to our Chief of Food Supplies."

We followed Rixon listlessly. Nothing seemed to matter, in view of what we had just learned.

And yet, so strange and complex is human nature, so easily can the human mind adapt itself to circumstances, so important can trivial details appear, that it was Rixon's mere presence that I resented more than anything else.

He assumed a proprietary air over Rita, a familiarity that she seemed to enjoy—or so I bitterly told myself.

Then fatigue and hunger reasserted themselves. We ate the food provided for us, nauseous though the black stuff was, and settled down to rest in the rough huts allotted to our use.

"A kind of warm moisture falls at times from the unseen cavern-roof," explained Rixon. "That's why we built these shelters to sleep in. Of course, there's no difference between night and day down here, but a few of us have kept our watches going, and one fellow

fortunately brought a motor-horn with him. We bugle you all up at eight-thirty sharp."

There are limits to human endurance, human capacity for wonder, fear or despair. We slept soundly in that warm atmosphere till bugle-call.

We came out of our huts to see a couple of small airplanes, with empty nets, hovering over the camp. One was preparing to ground.

"They have come for a quota of slaves for the mines," said a man at my elbow. "Wonder who is for it to-day? Will it be my turn?"

He spoke with fatalistic listlessness, with the dull apathy that fell upon most of the slaves.

A dozen of the Troglodytes from the vessel now at rest got out and walked rapidly in our direction. They seemed to single out our little group for their first attentions.

Were we to be sent to our living deaths so soon?

A Respite and Discoveries

I WAS near Rita, and her hand sought mine in a friendly grasp. No doubt, I thought, she would have gone to John Rixon in that moment of critical suspense, had he been in my place.

Well, what did it matter? Friendship or love, was it not all the same down here, where our lives were only the lives of slaves doomed to perish in the radium mines? Yet, hand in hand, we waited to learn our fate.

By signs and gestures, the Troglodytes motioned us towards the hanging nets, rounding up a group of about twenty of us. Rita and I were amongst the batch, but for some obscure reason Rixon and Dick were rejected. Our masters, perhaps, sensed John Rixon's authoritative rank and wished to keep him in position, and Dick was certainly looking rather seedy, lacking the fresh air and exercise of which he was always so fond.

We were just below the nearest airplane, when one of the crew suddenly leapt out and ran towards us, grunting and yelling angrily.

He was evidently somebody in authority, and the other hung about shamefacedly, sullenly, whilst he harangued them, pointing frequently to Rita and myself. In the end we were separated from the rest of our companions and motioned back towards our sleeping places.

We saw the others whisked away to their fatal work, leaving the Troglodyte who had rescued us in our camp.

"These beings seem so fearfully alike in their ugliness," said Rita, "or I should feel inclined to suggest that this gentleman, who is looking over us so critically, is the one who gave us our names yesterday. I'll try him with them."

She repeated the queer gutteral sounds slowly, indicating each of us in turn. The Troglodyte's pasty white face wrinkled into a hideous grin of satisfaction, and we recognized him.

"It's our tutor, all right, Mr. Harding, and that's why he rescued us, I do believe! He is going to be our tutor, our teacher. He thinks we showed our cleverness in picking up and remembering our names. After all, it will make things easier for them if they can communicate with us, talk to us. It will be easier to order us about, allocate work, and so on."

"Yes," said I, "and if you are right, there is more to it than that. They want to know something about the outer world, its size, population, and so forth."

"And we want to know about their world, Mr. Harding. We want to know their plans, and find out all we can about their resources. This is our greatest opportunity. I'm going to be a willing pupil; I'm going to smile on this white-faced goblin."

To cut a long story short, Rita was, as usual, correct. Her woman's intuition had divined the truth, while mine was still groping in the shadows of mystery and surmise.

The Troglodyte, whose name was Ulf, took our education in hand eagerly, pleased to find such ready and cheerful scholars. He repeated our names again and again, and then, pointing at them, named other objects—the ground, the roof, the stream of water, and so on. John Rixon and Dick, welcoming us as though we had been delivered from the very jaws of death, joined in and helped.

After a couple of hours of this strenuous mental work, we felt that we had made a beginning of understanding the primitive language of the Troglodytes.

And Troglodytes, for want of a better term, I shall continue to call these dwellers in the earth.

For several weeks we four met our tutor daily, and in spite of our dismal life and our repugnance to the tribe, began to feel some slight regard for him. He had, as Dick observed, glimmerings of humanity and yearnings for culture; he was as eager to learn from us and of us, as we were to learn from the Troglodytes and about them; he even admired Rita's beauty and courage in a clumsy and evidently quite sexless way.

So adaptable is the human mind, that we began to get used to our strange position—to everything except the food—and even to feel a sense of personal security. We felt ourselves specially favored by our grotesque masters and seemed in no danger of going down into the dreaded radium mines.

As the Troglodytes knew that escape was impossible, they allowed us to travel about in that strange underworld, questioning, looking, learning. We went mostly alone, and would meet later to compare our impressions.

"As far as I can make out," said John Rixon, after a long absence, "this underground world is not one great cavity, but a tremendous series of great caves, not many of them as large as our camp site here. It is more like living in the middle of a hard sponge! The caverns extend for hundreds of miles and go down to a tremendous depth."

"And I've found that there's a great circulation of water—hot springs, etc., heated from the still hotter area under the caverns," said Rita. "I've taken a trip on one of their small airplanes. I've seen their biggest settlement, seen the entrance to the mines, seen them making the poison gas. They seem wonderfully clever in chemistry and mechanics. The phosphorescent light for instance, is purely artificial."

"It's been easy for them in many ways," Dick remarked. "The earth is full of strange elements and

gases down here, and they have spent all their lives in burrowing and experimenting for goodness knows how many thousands of years. Think of having radium in chunks! No wonder they can fly with engines that only need one filling of fuel in a lifetime!"

They looked at me inquiringly. I had not contributed anything to the general stock of knowledge for several days. Rita, in particular, seemed waiting for me to speak. It was as though, for some reason, she wished me to "make good," to show that I was not less helpful than the others.

"I've been back to the great hole in the earth down which we came," I said. "I've had the chance to examine one of their outgoing airplanes. By good fortune, I happened to be left alone for half an hour."

"Yes?"

Rita bent towards me, her lips parted, her eyes shining.

"Yes—I discovered something. Don't be too sure, all of you, but if—if!—we can get out of here, I think there is a chance of defeating the blighters."

"How? Tell us!—tell us at once!"

Love in the Night World

"WELL," said I, "I hadn't much time and I was a bit flustered, as you can imagine, but I saw enough to realize that the paralysis ray and ray for dissolving the poison gas are similar to short-length wireless waves. The apparatus, though more complicated, is similar in essentials to a wireless transmitter."

"You were always keen on that sort of thing, Max," remarked Dick. "Did a bit of amateur radio transmitting on your own account; didn't you?"

"A lucky thing, too. I carried my experiments pretty far along certain lines, and I believe I've a piece of mechanism and some drawings at home that would help us now if I could only get them. In fact I think—though one can't be positive—that I was just on the verge of discovering such rays as these chaps use. There were some neat little gadgets on that airplane, gadgets that seemed to fill an aching void in the experiments, as I remember my work."

"You must go and examine the thing again," said John Rixon, decisively. "Take pencil and paper and make as many notes as you can. It looks like a forlorn hope, but one never knows. The fate of the world may depend upon your success."

"We must 'pal' up to our tutor and guide," said Rita. "Already he seems a lot more human, now we can make ourselves understood. I suggest that whenever Mr. Harding goes to the Outlet, one of us goes with him—to help, and, if need be, to distract the attention of any busybodies."

"I would be the first to volunteer," announced Rixon, "but as President I must stay and look after things here. Perhaps you will be able to go with our friend, Martin? Or if Martin is prevented, they would probably not object to your prowling about, Rita."

"I'm ready at any moment; we can start tomorrow," was her eager reply. So it was arranged that we two were to try to work back to the Outlet and make further investigation. Rixon could not keep a hint of regret out of his voice; nor could our desperate position or the hazards of our quest damp the warm glow of my heart.

When Ulf, our teacher, appeared next day, he was not alone. A Troglodyte woman—squat, coarse-featured, dressed exactly as he was, but still obviously a woman—was with him. The grunts and noises of Ulf's converse had a tenderer, less brutal sound when he spoke to her.

In a clumsy fashion, with many sidelong and backward glances of his big eyes, as though he were afraid, as though he dreaded being spied upon, Ulf introduced the woman to us, told her our names, and then led her, with Rita, to the shelter of an empty hut.

They went in together, and in a little while Ulf and Rita came out. The Troglodyte, with a sort of hangdog, shamefaced air, immediately left us, shaking his head vigorously at our symptoms of resuming lessons. The small airplane bore him quickly over the encircling stream, away into the darkness and the distant faint red glow and hum that came from the poison works near the great lake. No trip for us that day.

"What does it mean, Rita?" we asked.

"I think it is romance—Romance with a big R. I think Ulf has run away with Ulla, for that's her name. He has shown more feeling, more emotion, than I thought possible for a Trog. I believe he loves that creature he has left in my charge. Ugh! And yet she is an entity, a being, and capable of love, I suppose. Anyhow, he seems awfully scared—looks fearfully guilty."

"Is it a runaway match, an elopement—or can it be that the monster has run off with somebody's wife?" ruminated Martin. "It makes one feel quite brotherly towards the Trogs if they are capable of anything of that sort!"

"We must remember," struck in John Rixon coldly, "that we know nothing of the sex relationships of these beings. We don't know their marriage customs, if they have any. We don't know the rights and wrongs of the matter at all. What we do know is that we have to keep on good terms with Ulf, since upon him apparently depends our very slight chances of escape. You might help us by making friends with Ulla, Miss Courtney."

It was clear that for some reason our worthy President was ruffled. It occurred to me that he did not approve of any irregularity in love affairs, or any levity in referring to them in Rita's presence. I did not like the proprietary way he looked at her just then, even when he spoke so formally.

This strange affair of Ulf and Ulla threatened to put a stop to all our plans, for our tutor had no more time for us. He visited our cave regularly—only to see Ulla. He had to drag himself away, and grew more fond, more reluctant, more nervous, every time. We could do nothing; could only watch and wait.

And then came swift disaster. One day Ulf did not appear at his usual time, but two big Troglodytes,

"By the way they kow-tow to the chap, he is the Big Noise down here," said Dick, flippantly. "The King or Great Panjandrum of all the Trogs."

armed with long metal rods, came in his place. They dragged Ulla out of her hut, and without taking the least notice of us, began to beat her mercilessly.

It was a thorough, relentless beating, and her queer cries and hoarse screams were more than we could stand. After all, Ulf had left her in our charge.

The three of us interfered. Rixon knocked one Troglodyte down, while Dick and I wrested his rod from the other. They were completely surprised, and did not put up much of a fight. We chased them to the water, where one, croaking threateningly, swam across. The other, in a last scrimmage, got such a nasty knock on the head from the metal bar we had taken from him, that he sank in the stream like a stone, and never came up again.

"One brute gone to his account," said Rixon. "But we are in for trouble now, I am afraid."

He had scarcely spoken, when a small air-vessel, pursued by two larger ones, roared towards us out of the darkness beyond the water.

Ulf leapt from the foremost before it touched ground, and ran to where Ulla lay moaning.

The other vessels landed immediately after, disembarking a large party of Troglodytes. Grunting, growling, their hideous white faces distorted with rage, they rushed towards us.

The Passing of a Friend

It was a dreadful moment. We knew our impotence too well to offer resistance.

"We're in for it now," said Dick bitterly. "I always felt as if we were compounding a felony, or something worse. These chaps are wise to his little game, whatever it was."

"And worse still," Rixon had time to say, "they have got hold of the chap who swam across. Must have picked him up with a trailing rope as they came along. Ah!"

The infuriated Troglodytes had now reached Ulf and Ulla. Our tutor sprang to his feet, gave a hoarse cry, and signalled to us for help.

With a violent swing of his metal rod, he smashed in the skull of his nearest assailant. Then he drew something out of a fold in his coarse robe—a small, white, shining object.

A jet of flame, fierce, lurid, noiseless, jerked from its muzzle. The glare of it lit the vast cave with the sudden radiance of a lightning flash. Every object stood out in pitiless relief, crystal clear—the huts, the scared faces of our people, the foremost Troglodytes.

Rita covered her face with her hands, giving a sobbing cry of horror. Tough as I boasted myself to

be, I involuntarily turned my eyes from the sight.

The silent flame had destroyed the two nearest Troglodytes as a blast of furnace heat would have eaten away lumps of warm butter. Most of their bodies disappeared. They simply vanished. The light went out and the phosphorescent semi-gloom enwrapped us once more.

Ulf threw away the shining little gun as if it were useless now, as if he had exhausted its one devastating charge, and faced his foes desperately. I rushed up to him, Dick with me; but Rixon stood fast, and, with a grip of iron, held Rita back.

"Look!" he said. "It's no use. Even Ulf knows that he is beaten."

The angry Troglodytes had now surrounded us. Ulf and Ulla were each in the grip of strong captors. We were hustled, none too gently, back to the grounded air-vessels, our fellow prisoners driven away out of speaking distance.

Then from one vessel descended the tallest and finest-looking (or at any rate, the least brutal-looking) of all the underworld folk we had yet seen. He had a bigger forehead than the others, a really dignified bearing, and evidently expected the reverence which he received.

"By the way they kow-tow to the chap, he is the Big Noise down here," said Dick, flippantly. "The King or Great Panjandrum of all the Trogs. Is he going to hold a Court levee?"

"We are on trial for our lives, if that's what you mean," John Rixon spoke cuttingly. "And we can say nothing—do nothing."

It certainly was an impromptu trial. We could see that, even with our limited knowledge of the Troglodytes and the ways of the underworld.

There was much pointing, grunting, gesticulation and angry questioning of our tutor and the woman for whom he had evidently risked so much. With every sense alert, we gathered from the excited talk that Ulla was the chosen of the tall one, and that Ulf had broken the sternest laws of this shadowland.

They had committed a monstrous crime, those two. The outcome of the trial was a foregone conclusion. There was no hope for them.

Yet Ulf and Ulla now stood up boldly defiant. They sought each other's eyes, and love transfigured them. Squat, coarse, ugly, brutal as they seemed, the light that leaped from each to the other was the light of a love that would conquer death.

The sentence, put as near as possible into our words, was something like this:

"For you, Ulla, there can be no mercy. You have sinned against the world and against me. You die by the Flame. For you, Ulf, for whom she sinned, there is mercy. Mercy, even though you have openly rebelled against My Law. Your life is spared. You shall be sent to work in the lower mines."

That, at any rate, was the gist of it. And then the tall one gave a grunt that meant:

"Carry out the verdict."

A Troglodyte advanced towards Ulla, a shining little gun in his hand. He would kill her with the destroying flash of flame.

A glance passed between the victims, a glance whose poignant pathos will haunt me to my dying day. Then Ulf broke away from those who held him and, crying something which we could not translate, flung himself between Ulla and the shining gun.

The tall one groaned, stretched out a warning hand, but too late.

The flame leapt from the gun, lighting up the cave with its garish radiance, and the bodies of Ulf and Ulla, clasped together, vanished. Together they had passed on. For where love is, there can surely be no death.

For the moment we forgot our own position, our own peril, and the menace that hung over the upper world of sky and sun—that world already seeming so remote.

Then our captors closed round us, and the tall one assumed his grotesquely pontifical air.

"There are the slaves who have learned to speak with our tongue, who have aided Ulf in his crime," said a Trog, grovelling before the tall one. "What shall be done with them?"

"They are only slaves; I will judge them quickly," was the substance of the Chief's reply.

"It's the finish, old scout," said Dick. "We can only die game. Good-bye all."

Caught in the Act

WE were utterly unprepared for what followed. The strangeness of our surroundings, the bizarre ugliness of the Troglodytes, the hostility we felt towards them had warped our judgment. They were better than we would admit.

"The slaves shall go free," was the purport of the tall chief's verdict. "They can know nothing of my laws. I will send them another teacher, for they have greatly helped in keeping their fellow-slaves quiet and orderly. These four must not be sent to the mines."

The tall one was grim, cold, pitiless, but he had good sense, and he certainly spoke with authority. We bowed to him gratefully, but he at once turned his back on us, grunted to his guard, and climbed back into his air-vessel.

We were only slaves, useful slaves, after all. It was justice, impersonal, common-sense justice, we had received, not mercy.

"But it is something to have found these two things in this nightmare world," said Rita: "Love and Justice. Where these can exist, there must be hope of progress, of betterment!"

Then followed days of waiting, of weary learning, of hard work at our several duties in the Slave Republic, of daily heartbreak as friends and acquaintances were taken from us to the death-in-life of the mines.

Perhaps I have dwelt too much upon our own feelings and doings, and not sufficiently on the troubles of our fellow-prisoners and the news that filtered down to us with every fresh batch of victims from the daylight world.

After all, one's own affairs interest one most!

The work of keeping some semblance of order and sanity in the Slave Republic, amongst these fated people of mixed races and nations, was no light task.

We had to be severe at times, to check panic and hysterical outbursts; we had to be careful how we divulged the true perils of our position to the newcomers.

But for John Rixon, the work would have been impossible. The man was a marvel. He had risen to the occasion nobly; he was tireless, dominant, resourceful, tactful, respected, admired, loved, hated. Loved by the best of us; hated by the small-natured and ill-balanced.

It was no wonder that he and Rita seemed to draw nearer to each other every day. They had so much in common; their tastes, courage and physical charm were so much alike. And they had been brought up as playmates together for several years, Rita told me one day. They had always been John and Rita to each other.

Of course I had no right to resent their friendship. Surely there could not be a better couple mated than these two, if—as seemed only too probable—it came to that.

As Chief of the Information Bureau, where we kept what meagre records we could on the scraps of paper available, I was busy. It was hard and tiring, that and the training I got from the Troglodyte tutor, but John Rixon was firm in holding every one of us down to the grindstone of duty. He tired our bodies, but kept our souls alive.

Up to the time I again found an opportunity to investigate a Troglodyte air-vessel and its wonderful weapons, we had gathered the following outline of the state of affairs in the world above. Every new prisoner brought in, I should state here, was thoroughly questioned and cross-questioned, and all statements made were checked and cross-checked as far as possible.

Panic had begun to shake the civilized world. The Troglodyte air-vessels, capable of enormously long journeys at high speed, had trailed death and destruction over three continents.

No effective method of fighting them, of combating the poison gas, had been found. No attack made on any of the enemy camps had been successful.

Buenos Aires, Montevideo, and Lima had been blotted out as Rio had been. Captives had been taken up from hundreds of places in South America, Australia and New Zealand.

Many ships had been sunk at sea, apparently in a spirit of wanton mischief. North, east, west, the raiding destroyers were traveling, spreading ruin, dislocating transport, isolating communities, imperilling civilization.

"But we know enough of the Trogs by now," said Rita one day, as we sat dismayed by the ever dismal news, "to know that they don't do anything just for mischief. They are a very cold, precise, intelligent sort of animal. They are annoyed at the resistance they have met in our world, and they are deliberately trying to spread fear and panic, so that they can collect slaves as and when they want, without having to fight all the time. They have no more regard for us and our achievements than we have for an ant hill when we want the eggs to feed pheasants!"

"I'm afraid you haven't much time to spare, Harding," Rixon remarked, "if you wish to get away with your information. If you don't go soon, the outer world will simply become a breeding-ground for slaves. We must get busy at once."

That very day a chance offered itself to us. Our tutor intimated that the Chief wished to question us about our own world, and we four were taken to the great opening at the bottom of the Outlet. There we had to wait until summoned to the presence.

Within an hour after reaching the Outlet, I had found an airplane unguarded, and with Dick aboard, used my eyes for all they were worth.

My previous ideas were confirmed. The radio waves that created nerve paralysis and also those that dissipated the poison gas were short-length waves, such as I had almost discovered in my home experiments.

I made hasty notes, a few rough sketches of the all-important transmitters, and was just going to try the effect of snapping a switch on the radium engine, when Dick, glancing up, gave a low whistle.

"Drop it Max, and look as innocent as you can. Here comes His Nibs, with our tutor and about a score of the ugly brutes. They've seen us; there's no getting away from it."

The Heavy Hand of Despair

LONG before the Troglodytes reached us we knew that we were not going to be treated lightly this time. Their faces were eloquent of anger, and the face of the tall one was the blackest of all.

We were unceremoniously pulled out of the vessel and hustled before the Chief. We could not say anything in our defense; we could only stand and wait.

From the excited gruntings and arguments, we could make out that there were two parties amongst the crowd of sycophants. One lot urged the Chief to have us killed by the Flame at once; the others pleaded for delay on the ground of our usefulness. We could be killed or sent to the mines as soon as more slaves had been trained to our intermediary work.

"This is my judgment," said the Chief at last. "Let these two be imprisoned. As for the other two, I will speak with them."

We hoped to see John and Rita and let them know of our plight, but it was not to be. A couple of the animated pasty-faced gargoyles laid rough, strong hands upon us and dragged us to a small cave in the rock. It was a small space, almost as small as a kitchen in a working-class house, and secured with a stone door.

"No way out," said Dick, as the slab banged dully into its groove.

"No light, except this ghostly underground glow through a few holes up there. I hope they won't keep us here very long."

"That's troubling me," said I. "That's one thing we haven't found out—how long these Trogs live—what is their average 'expectation of life.' They may live to be well over a hundred, and in that case they

may keep us here for a few weeks and think they are treating us well. And here am I, with what I know!"

"John Rixon's our only hope, Max. He's sure to get to know, and he won't let us down if its humanly possible to save us. He's a great man. He and Miss Courtney are about the finest couple I've met. Of course, I oughtn't to say it, but one can't help seeing things—it was rather a bad day for you when these two met."

"Dick," said I, "cut it out. I'm not acknowledging anything of the sort, and in any case, such ideas are no good down here, are they?"

"Not much, but we may get back above some day. I wonder if we shall? Doesn't look promising."

It didn't. Except for being fed very sparingly, we were left in that dark, stifling hole for what seemed an eternity.

I have not previously mentioned a method of communication largely used in the underworld. Nearly every moment since we had come down, we had heard continual but erratic tappings and knockings against the rocky walls. It was a regular system of sending messages, developed to a high pitch of perfection.

This rock-tapping was almost the only sound that penetrated our prison walls. It was all around us, tap, tap, tap; and at times it rose to a maddening crescendo of jarring noise.

And the longer we were immured in the vile little cave, the more insistent and maddening became that tap, tap, tapping. We felt that if it went on much longer we should become nervous wrecks. At last, when we had given up hope of relief, in the midst of an increasing outburst of noises, the door was opened to admit Rixon.

"I've come as soon as I could," he said. "I've got in the good graces of the Chief, and he has allowed me to see you; but I can't stop many minutes. Here's a hand-torch, Trog manufacture, to lighten your darkness now and then. Now listen carefully.

"You will have to put up with this hole for some time longer, but when your sentence has expired, you will be freed and set to work again. There has been an enormous influx of fresh prisoners, and Rita and I have been busy, both here and way back in the prisoners' camp, keeping things ship-shape. If we are here when they let you out, Rita has a little surprise to spring upon you. Don't ask me now what it is.

"It seems the Trogs have met with resistance everywhere above ground, and it is making them angry. They have formed several big camps in Africa and South America, and are continually sending out raiding parties to terrorize us into submission. As slaves, we are dying off terribly fast in the mines, and the supply has to be kept up. The Trogs are trying all sorts of races and nationalities with a view to finding and selecting the sort of human that will make the best and longest-lived slave. It's simply horrible, and the panic and disorganization in the upper world are getting worse every day.

"There's only one gleam of light, excepting your own discoveries, which at present are useless, Harding. And that is that the atmosphere of the upper world does not suit the Troglodytes. All those who go out come back with some sort of catarrh, and many of them with worse diseases. Our upper-world germs are getting busy. Of course, lots of them recover when they get down here again; but not all. I've had to doctor a few. I've pulled the Chief himself out of a fever he caught on his last voyage—that is why he allowed me to come here now. I never knew before, that I had the makings of a medico in me!

"There's some gratification in that knowledge, but it may be that civilization—as we know and value it—will be extinct before disease calls a halt down here.

"I've learned enough since you were put away to feel sure that in mechanical skill, inventive cunning, and sheer selfishness, the Trogs are our superiors.

"Well now, buck up; set your teeth hard and last out the rest of your sentence. You won't be kept a moment longer than the time given. I'll try to send you in a bit more varied fodder. I can do no more. So long."

With a hearty hand-grip, he left us.

Dick was much cheered at first, but as the weary hours and days dragged on, he relapsed quickly into the old apathy. The cave was, by this time, a veritable torture-chamber.

For myself, Rixon's visit had only served to lay heavier upon me the already heavy hand of despair. To be imprisoned here when I ought to be up and doing—to have lived through so many dangers—to have discovered what I had, only to wait helplessly in this hole was intolerable.

And to add to my despair, there were Rixon's ominous words:

"Rita has a surprise for you. Don't ask me now what it is."

What could this surprise be; something I feared and yet expected. Something that would rob success—if by some miracle I achieved success—of all joy?

What could he mean, if it was not that Rita and he had come to an understanding?

The dim twilight of the prison cave was as sunshine compared with the blackness that enwrapped my spirit.

John Rixon's Choice

IT was some considerable time after John Rixon's visit when, flashing the electric torch idly about the floor for want of a better occupation, I found a diary. It was a small book, pocket type, with three days to a page.

"Umph. Rixon must have dropped it," said Dick, and straightway lost all interest.

As I have said before, our clothes were now getting pretty ragged. I put the little book in my pocket, and soon after, heard it fall out on the floor.

Under normal conditions I should never have done that of which I was then guilty.

The diary fell with its leaves apart, and the circle of light from my lamp revealed several words in John Rixon's bold, angular writing. I saw my own name written there.

I glanced at Dick, he was crouched in a corner of

the cave, staring fixedly, with unseeing eyes, at the damp wall.

I picked up the little book, and these are some of the extracts I read:

"Wonderful to have met Rita here. . . . Should have been better pleased" (pleased, down here, ye gods!) "if Harding had not been with her. Harding's a decent sort of chap, I think . . . a bit conceited perhaps. Not much to be feared from Martin, but Harding is clearly involved. . . . There were some blank pages and then one or two recent entries. "Ought to have a better chance than Harding. Certainly, if he were out of the running. . . . Going to be a tough job making my mind up about this last affair. The old stunt—Love versus Duty. Anyhow, all our hopes are on Harding."

There was more, but my conscience had begun to function again. What a cad I was! I switched off the torch and stowed the diary away in my one secure pocket. I was too ashamed to tell Dick what I had done.

The cryptic references to a conflict between love and duty baffled my dazed, numbed brain; but I soon gave up bothering. Nothing really mattered now. I might be conceited, as Rixon thought, but what chance had I against him? None—none.

During the remainder of our imprisonment, Dick and I went down into the very depths of human misery. I will not dwell upon our hardships; upon our haggard fears, our uncertainty as to what might happen to prevent our release; upon the constant hypnotizing, maddening tap-tap-tapping of the Troglodyte signals on the rocks around us.

Somehow we survived until the door opened to set us free.

"Never thought to call this funny violet glow the blessed daylight, but it seems almost as good," said Dick.

His voice faded away as he tottered forward and collapsed in my arms. I could scarcely keep up myself.

John and Rita came and took charge of us, and for several days Dick was out of everything. I must have been tougher than I thought, for I was quickly active and about again.

The Trogs kept us busy, making us help them in sorting out the constant flood of new slaves that the helicopters brought down the Outlet. It seemed madness to think of any possibility of escape. Then, one day, after a particularly long and strenuous spell of work, when we were all supposed to be resting, the great chance came.

It was John Rixon that showed us the way. He roused us all in turn, and we met in the dense shadow of one of the larger vessels of the twenty or so that were lying on the open plain under the lower end of the Great Outlet Shaft.

"I fancy the Trogs hereabouts are as tired as we are," he said. "They all seem to be sleeping off their fatigue, and there isn't a single sentry on guard. I've gathered enough from scraps of talk I've overheard to feel sure that they trust us now. I am 'in good' with the Chief, since I doctored him as I told you; and they are convinced that your punishment has cured you of any further unwholesome curiosity.

"And I have actually learned that this particular vessel is the very next one to go out, and is bound on a long voyage of exploration."

"You want us to seize it and clear out ourselves?" said Dick. "Don't forget that we don't know how to work the engines. Nasty stuff to experiment with—radium!"

I was very curious myself. I didn't see what chance we had of reaching the top of the Outlet alive, even if we got going. The Trogs could fetch us down any moment by a whiff of poison gas.

"We have a better idea than that, Rita and I," said John Rixon. "Why not get aboard and hide ourselves till we are in the upper world; in fact, go out as stowaways? There is plenty of room on a sort of lower deck, amongst the stores—enough to secrete three of us at least, with a supply of food and water. Yes, three of us."

He stopped, looking keenly into our faces. I knew now what certain passages in that diary of his meant. (I had handed it back to him, and he had taken it without asking any questions.) Three of us were to go; one must be left behind.

"Yes, John; three of us. What about the fourth?" Rita's voice was firm.

"Harding must go—that admits of no doubt. He has the knowledge that may save the world. He will go. Then you will go, Rita; for we could not leave you here when the first chance of escape offers. I take it that we are all agreed on that?"

"I see," Dick groaned. "It's between you and me, Rixon. You want me to offer to stand down, of course. As a person of importance, and for another very particular reason, you want me to sacrifice myself and let you go. What if I refuse to be sacrificed? My life is as valuable to me as yours is to you."

"I don't want you to do anything but obey, Martin. I shall decide who goes, who remains. The others will accept my decision, I know; so must you. Only give me a few moments more."

Almost as well as if I were one with him in soul and spirit, I knew what was passing in John Rixon's inner self. Strong, virile, loving life passionately, loving Rita Courtney with all his heart, every natural, selfish human instinct urged him to take the opportunity of escape. Only his duty to the hapless slaves below stood in the way. What would he decide?

The Silence of Dick Martin

EVEN as he spoke, I knew what John Rixon's choice would be. It was the choice I would have made in his position—if I had been brave enough.

His brief Gethsemane over, he turned and faced us calmly.

"You three will go; I must remain. It is a duty I owe to the unfortunate slaves; I should be a cur if I shirked."

"I should stay too," said Rita. "I have work here, too; amongst the women slaves."

"You will go; I shall not allow you to stay." Rixon spoke curtly, savagely. "We have some very good women organizers. Now, you two, help me with this little package aboard. This is the surprise Rita and I have had in store for you."

"This" was a thick, short object of twisted cords and wires, roughly folded together like a skeleton umbrella—a bulky, "stumpy" umbrella, with a strong rod and cross handle, but without any covering.

"It's a parachute—of sort," explained Rixon. "Taken us a lot of trouble to make in our odd moments of spare time. Our idea is that you may need it—you may not be able to leave the vessel otherwise unobserved. You may have to jump out during darkness, if they should do any night traveling. A lot of 'may' and 'if' and 'should'—but we can't help that."

So this was the surprise! A weight was lifted from my mind.

"But where's the covering material?" Dick asked.

"That has been our great difficulty," Rixon answered. "But we have the stuff here, and Rita has needles and thread. In the space aft, where you three will hide yourselves amongst the stores and the stacks of gas bombs, you will have to get the cover sewn on. We can't wait now or risk another failure. Take the goods and get under cover—we've stood here and talked long enough."

It was wisdom to hustle us aboard, but there was more than that in John Rixon's dictatorial command. The man was suffering a terrific mental strain. I felt that he could not keep up his cool, stern demeanor very much longer.

We clambered into the airplane and found our quarters. They would be cramped, but when we had stowed away the parachute and its cover, and our own food, we felt reasonably safe from discovery. There was a big heap of miscellaneous stores, and we were ensconced behind this in the darkness of a low recess under the top deck.

Rixon wrung each of our hands in turn as we stepped out of sight, and I fancied he clung to Rita's before he let her go. We said "Good-bye"; he said "Good luck"; we could find no other words.

We heard him walk across the deck, climb down; heard his receding footsteps fade away.

It was a weary, anxious time, waiting there in the semi-darkness. Tired though we were, sleep was not to be won, and we had no chance of working on the parachute till the machine reached the upper world of light.

Presently the great dim dome under the Outlet grew noisy with life and movement as the Trogs got to work after their rest.

We heard the faint crescendo and diminuendo of signal tappings on the distant rock walls; the confused murmur of grunting conversation; the drone of airplanes going to and fro in the great cave-ways. Some 'planes with the subdued groan of vertical propellers, came down the Outlet; others, roaring and grinding, ascended.

Then the crew of our vessel came aboard and began their duties. The radium engines (throbbing dully in their lead-sheathed covers) were started, and the smell of lubricating oil filled the air about us.

At any moment we might be off. I felt my heart almost cease to beat when a couple of Trogs, already goggled and heavily clothed, came down the short steps from the upper deck and began to search for something amongst the stores. With grunts of satisfaction they found the package they wanted and stooped to pick it up.

At that very moment Dick made his fatal blunder. I saw what he was doing, but dared not make a sound. The roll of material for covering the parachute had shifted with a lurch of the vessel, and Dick was afraid it might be seen, as, indeed, it might.

He stretched out a hand from between two tiers of gas bombs, and began pulling the roll slowly and quietly under cover.

The movement, the hand, caught the eye of one of the Trogs. With hoarse cries, the two waddled forward. One seized the roll of stuff; the other fellow's talon-like fingers closed round Dick's wrist. With a fierce jerk, he pulled our companion out of his hiding-place.

Rita's hand sought mine, and we waited, silently, tremblingly, for discovery. If those two demons, who had got Dick, came to look for us, then indeed, all was lost. If even Dick, in his surprise and chagrin, called to us, or cast a backward glance, our fate would be sealed.

Peering through the spaces between the stacks of bombs, we saw the Trogs hustle Dick towards the ladder leading the upper deck. There, a Trog in authority—the skipper, no doubt—began roaring angry questions, gesticulating, pointing, threatening.

We caught enough to gather that he was asking our unfortunate friend why he had hidden on the vessel, what the roll of stuff was for, whether other prisoners knew of his action.

Not a word from Dick Martin, not a single backward look.

Not even when a Trog pointed a flame pistol directly at his heart, did our comrade flinch. He knew that the least hesitation or confusion, the cleverest explanation, would only arouse keener suspicion.

"Tell us slave, why you are here? Tell us who are those other slaves who must know of your doings?" grunted the Troglodyte captain. "Tell us, and you shall be set free unhurt. Tell us—or I send you back to the prison where already you have been, where you will be left to die."

That, at least, was the purport of it.

"Back to prison where you will be left to die!"

It was a terrible choice, an awful alternative.

We crouched there in the darkness, silent and helpless, only restrained from rushing out to try to rescue our comrade or to share his fate by the knowledge that the welfare of the world forbade us—by the knowledge that he, facing a terrible death, would wish us to be still.

"O Sky, O Sun!"

I THOUGHT it was not in Dick's nature to go down without fighting, so I was not surprised to hear the sound of blows, of a scrimmage.

When they came to hustle him overboard, to hand him over to the crowd of Trogs now gathered round the airship, he struck out manfully. Judging by their cries, we guessed he had got a few blows home, before they turned the paralysis ray upon him and carried him off to his fate.

Rita's hands clasped mine with such nervous force that her little nails dug into my palms. A cold moisture stood out on my forehead. Yet, as Dick kept silence, so did we.

Then the engines began to work more fiercely, the side planes fluttered, the vertical lifting propellers whirred and roared as the airplane rose from the ground and began the long ascent of the Outlet. From the cavernous world of phosphorescent light we passed upwards into a world of darkness.

The engines were evidently working at heavy pressure, as they literally screwed us up and up through the long shaft. The vessel creaked and groaned; the aroma of reeking oil made us sick. What if the engines failed, or a bearing seized, or a propeller broke? It would mean a plunge to instant death.

Yet it was not that fear that kept us awake and alert all the long, long way to the upper air. It was the danger of discovery by the Trogs. I cannot understand, even now, why they did not investigate further, why they did not make a thorough examination of the storage hold after finding Dick. One is loath to talk of Providence these days; let us say it was just our wonderful good fortune.

As the weary time of this upward journey passed, we must have dozed, both of us.

I was aroused by Rita shaking me gently; one hand, cool and soft, laid across my mouth.

"We are nearly there," she whispered. "I have been asleep too. As soon as the light comes, you must help me with the parachute."

"You forget," I whispered back. "They took the cover stuff away when they caught Martin. There will be no parachute now."

This time I had to hold her in a fierce grasp to check the sharp cry of vexation that was ready to her lips.

Already a dim twilight was stealing into the hold, a delicate, soothing glow of natural radiance from the top of the shaft.

From the opening in the upper deck this radiance came, broadening and brightening moment by moment as the vessel neared the upper air. Objects grew from ghostly shadows to real outlines, and out of the defeated darkness came Rita Courtney's face, close to mine—worn, strained, but lovely and lovable beyond compare.

Presently the light grew stronger, and the sound of the machinery changed. The vessel had leapt from the Outlet, was moving horizontally in the clear air of a golden day. A shaft of sunlight pierced the hold, falling full on Rita's head, and through the deck-opening we caught a glimpse of silver-tipped clouds floating in the blue.

"To be up here again," she whispered. "Oh, it is too good, too sweet! O sky, O sun! I never thought to see you again!"

Till that moment of realization I had not known how dear the sight of sun and sky and earth could be; had never known how utterly, in the world below, I had lost hope.

Our spirits sang with joy, what time our poor, tired bodies, made tender by our sojourn in the ever warm atmosphere of the depths, shrank and trembled in the chilly upper air.

"And what shall we do now?" I whispered, trying to still my chattering teeth.

"At present, nothing, except to eat and keep quiet, waiting our chance," she replied. "I have an idea, which I will tell you later on."

So we had our first meal, on the unsavory chemical food we had brought with us, made ourselves as comfortable as we could in the confined space, and waited.

The air-vessel throbbed steadily on over miles of steaming forest, coming to rest at last in the camp from which we had been taken to the Outlet weeks—was it weeks, or months, or years?—ago.

No chance of escape there. The camp was full of watchful enemies; the surrounding jungle, trackless, danger-infested, malarial, hopeless. We hid in our cubby-hole for a day, sweltering, tormented by flies and mosquitoes, and not once molested by the crew.

Then the vessel rose again, apparently freshly provisioned, and set out in a westerly direction. At a great elevation we crossed the Andes, swept over the narrow Chilean coast, and stood out into the Pacific.

In our strange and embarrassing companionship, we had now taken it in turns to sleep and keep watch—turn and turn about. It was in the early morning when Rita woke me hastily.

"Listen," she said, as soon as I was roused enough to understand. (We had now found it possible, owing to the noise of the machinery, to talk quite safely in low tones.) "I have gathered enough of the conversation going on above deck to find out where we are bound. They speak of passing over a great land surround by bitter water—salt, they mean—and then going further north on a voyage of exploration and terrorizing. That land must be Australia. We should be passing over it to-night, if my estimate of our speed is anywhere near the truth. Then will be our chance—probably our only chance."

"But if they don't land anywhere?"

"Then we must use the parachute."

"We've no cover; the thing's useless," I protested.

Was it possible that Rita Courtney was losing her memory?

"We must make a cover, Mr. Harding. We must get to work at once. I will show you how I think it can be done. It's a dreadful risk, but we must take it."

A Leap Into Nothing

SHE produced needles and thread from a little hold-all she had managed to keep through every vicissitude.

"No scissors! Have you a pen-knife Mr. Harding?"

Wondering, I handed over my one and only.

She looked at me quizzically, with an expression I could not read. There was resolution in it, confidence, even mischief—and yet I couldn't make head or tail of it, nor of her slightly heightened color.

"We are in a terrible pinch, you and I, Mr. Harding. These Trogs will never let us escape alive—we have learned too much. Yet we must escape, not so much for our own sakes as for the sake of humanity. We have simply got to cover this clumsy parachute, however badly, and make the attempt to land, no matter how dangerous."

"Cover it—yes. With what?" I asked, though I began to see light.

"With as much of my dress as I can spare! This is no time to study conventionality or false modesty. There isn't so much of the dress as I could wish, but I must sacrifice everything if need be. And there's your coat—even your shirt, Mr. Harding! Let us forget everything except that we are two human beings whose existence is essential to the world."

"You are wonderful, Rita," I said, using her name for the first time.

Her eyes dropped and she began unfastening her dress. I felt that I had betrayed the sudden feeling that overwhelmed me—that she had not responded, and yet that she was not displeased. But this was no time for sentiment!

We worked hard on that wretchedly amateurish parachute. Before we had finished it, had clumsily sewn on to its skeleton Rita's dress, every scrap of material she could spare, together with my coat, waistcoat, shirt and undervest, our fingers were stiffened, our hands numbed, and our teeth chattering with the icy cold of the upper air through which the vessel was rushing.

But, such as it was, it was finished at last, and not a moment too soon. The semi-tropic daylight faded out as we gave the finishing touches. We could only wait for complete darkness now, and some signs of land; then we could make our attempt. There was a chink in the metal wall of the deck through which we could get occasional glimpses of the sea below.

"It is a poor sort of conveyance," said Rita, as we sat back to back for warmth. "It seems madness to jump out and trust our lives to it. If there were any other way—but there isn't."

It was soon night, black as pitch, and from the peephole, we could not tell what lay below us. The air-vessel rushed on at terrific speed, and a confused murmur of excited grunting went on above deck.

Just as we were deciding to try to make the deck at all risks, and I had found a charged paralysis gun in the hold, together with a couple of metal rods that might be useful in the struggle, the noise above burst into an angry roar of rage, a storm of panic. With a rending crash something heavy fell to the deck, and one of the engines raced, screamed harshly, and stopped.

"What is it?" whispered Rita, as we clung together.

"Machinery broken down," said I. "I have heard main driving shafts snap before. But just listen! We haven't made that umbrella too soon. They can't descend; they daren't stop!"

We summoned all our laboriously acquired knowledge of the Troglodyte speech to try to understand the meaning of the panicky uproar, and my first impressions were soon verified.

The main gear shaft of the lifting propellers had gone, and the Trogs were unable either to rise or fall. The aerial voyages were always begun and finished with a vertical rise or fall—they had never learned the art of gliding to rest, or rising from a run on the level. The cave world was not suitable for such tactics, and the tremendous power of the radium engines had made the helicopter method practicable.

But now that the lifting vanes were out of action, our vessel could only rush on horizontally at its present elevation.

"And when they stop the engines, or the power gives out, we shall drop like a stone," I said. "It's now or never for us, Rita; we must be nearing land. Are you ready?"

"Ready, aye, ready!" she said.

A Trog came into the hold as we steppea from our hiding place. He flashed a torchlight on us and gave a warning cry. I let him have the metal rod mercilessly, and we stepped over his dead body.

At the top of the steps leading to the upper deck, we met more of the Trogs. Giving Rita the paralysis gun to threaten them with, I smashed at the foremost with savage energy. The action warmed my chilled blood, and in a sort of Berserk fury, I drove them before me.

Panic-stricken at their plight, anyhow, our sudden appearance startled them out of their senses. Before they knew what was happening, I had cleared a way to the vessel's side and we had dragged the parachute up.

Dazed, uncomprehending, totally unprepared for what we were about to do, the Trogs stood in a cluster watching us as we got the clumsy affair upright and partly open.

No doubt the sight of the paralysis tube kept them off for a time, though they might have used their flame pistols if they had not been taken by surprise; but they hesitated uncertainly, and, while they hesitated, we acted and their chance was gone.

Poor devils! Whatever our fate, they were going to a fearful end.

I peered over the side and shuddered at the prospect. Yet there, to westward, through a break in the rolling cloud masses below, a few glittering points of light shone out—shone and vanished—and shone again.

Land! Lights! The homes of men!

"Get ready," I said. "Are you fast? Pull this a bit tighter. Take hold! Shut your eyes, and when I say the word, jump!"

We had now tied ourselves to the main shaft and cross-bar of our parachute, for we were too cold to be sure of holding on for long, and had clambered on

the low bulwark, slowly and with ever fearful care.

We poised the great umbrella above us, nerved ourselves for the shock, and, as a hoarse cry burst from the Troglodytes, sprang together into the deep and empty gulf of night!

The City of Anarchy

THE horror, fear, and nausea that gripped me as we dropped, are beyond the power of words to tell. But for the sight of the air-vessel seemingly leaping up and way from us, the upward rush of air, and our dreadful internal feelings, we should not have known we were falling. But those three items were quite enough.

The air sang and roared in our ears as we hurtled downwards with frightful velocity, the home-made parachute refusing to open fully for a long time.

Would it ever open? I have never asked Rita what her thoughts were, but I know I pictured, all too vividly, the probable end of our journey. Desperately as we clung to the pole of the scarecrow contraption we had made, it was well we had tied ourselves on. Already, as we passed through the chilly dampness of the cloud layer, I felt my numbed fingers relaxing their hold.

Speech was impossible, with that fierce uprush of air almost drawing the breath out of our bodies; we could only look down at the dark earth, dotted here and there with the glare of fires, or at each other's white faces faintly visible.

Then I heard a dog bark, then a thin wailing cry that had in it a human note, and the upward gale changed to a gentle breeze.

Our parachute had opened out at last and had checked our headlong fall.

"You and I are destined to die peaceful, natural deaths, Mr. Harding!" panted my brave companion. "We are experienced aeronauts now, but never again in this sort of vehicle—never!"

"Never again!" I echoed, with a shudder of relief, as we sank slowly earthward in more or less graceful gyrations. "Where are we, I wonder? Over land, certainly, though there is the glimmer of water yonder. Looks like a big city, not properly lighted, and on fire in places. Plenty of queer noises too."

"One of the Australian capitals," said Rita. "Maybe an earthquake, or more probably the Trogs have been at work here already. But we are going down faster again—our hand-sewn umbrella is cracking up under the strain we have put on it. I never imagined it would last as long as it has."

Our descent came to an end a few moments later. The patchwork cover of the 'chute ripped right across, several stays broke loose and then the main shaft broke in two. We went down with a sudden drop and with the lower fragments of the pole still fastened to the pair of us, landed heavily on the flat roof of a warehouse-like building.

Down here it was very windy, and the top of the parachute, a mass of torn rags, was blown away in the gale.

Except for the fitful red glare of a fire not far away, in which the roof glistened as with recent rain, it was terribly dark. Volumes of pungent smoke drifted across the house-tops, acrid, choking.

With the aid of my old penknife, we freed ourselves from the last remnant of our old vehicle. We rubbed our stiff joints and stamped about to revive the circulation in our cramped and chilled limbs.

We had collected a number of nasty bruises, but had come down without breaking any bones.

"And now for the lower regions," said I, "and to find out exactly where we are and what is happening. It would be unbearable if we found ourselves stranded here after all, unable to get away. May have been a revolution, for all we know."

"In any event, Mr. Harding, I must get some clothes," said my companion decisively. "That is the very first necessity. I couldn't go into the streets—even in the dark—like this. It didn't seem so bad in the airship—with you—but down in the streets! Go down first and get me some clothes. I'll wait here . . . Well, I'll follow you then."

As we descended the spiral fire staircase that led from the roof, I remembered Rio de Janeiro, that other city of disaster I had seen, and nerved myself to face whatever we might meet.

The building into which we penetrated proved to be a huge general store, a vast universal emporium, with many passages, staircases and lifts. The lifts were out of order, the electric lights would not glow, and we walked and stumbled through the maze until we reached the dress and drapery departments.

Here I left Rita for a little time, while I made a few additions to my own wardrobe in the men's section. There was not much choice, for looters had evidently been at work, but I felt cleaner and more respectable in the few new clothes I could find.

Lit by the flickering red glow of some fire that was raging not far away, a new and altogether wonderful vision came to meet me. Rita herself says she felt and looked—a perfect fright.

No doubt the dress and its appurtenances were not exactly what she would have chosen. She had to have what the looters had left. No doubt the color scheme was simply murderous, the coat too long, the sleeves too short, the hat unspeakable, the fit of every item execrable—but to me, Rita Courtney looked glowing, wonderful.

"Did the best I could, Mr. Harding," she said. "Anyhow, I'm ready for an early breakfast now, if we can find the café and there's anything left."

We plunged into the labyrinthine passages of that derelict hive of business, groping our way towards the rear. We had not gone far when a fresh outburst of sound rang through and above the uproar that came to us from the stricken city. Hand in hand, we stopped, listening, waiting.

There were cries, shrieks, groans, fierce yells, the crack of revolvers, and then the rending, smashing sound of breaking windows, the tinkle of falling fragments of glass.

"More looters breaking in!" said I. "We had better get out as quickly as we can."

Mr. Hopkins Enlightens Us

THROUGH stacks of rolled linoleum and carpets, through avenues of gimcrack furniture and piles of useless articles of luxury, we came at last to what was left of a refreshment room. Stopping only long enough to commandeer a few biscuits and a drink of soda water, we groped our way out and found ourselves in the street.

"Been some dreadful work here," said Rita, clutching my arm. "That heap of dead—how awful! The Trogs have done this."

We hurried past the group of shriveled bodies, knowing only too well how they had met their fate. Their stricken attitudes and shrunken frames spoke only too eloquently of the dread poison-gas.

To a town-dweller, country roads seem hatefully dark and desolate on a cloudy winter night. You must double, quadruple that sense of isolation to get some idea of what we felt as we picked our way through the unlit streets of that unknown city.

Every footstep forward was a step into mystery, and the few snarling dogs we met, the corpses we stumbled upon, the flickering reflection of fires in the sky, the clouds of choking smoke, the medley of strange sounds—all these things added horror to the mystery.

Rounding a corner into a wide, main thoroughfare, we came in sight of one of the fires, and of what was left of the human life of the place.

A huge, five-storied shop was blazing, its interior a mass of flame, its wall silhouetted redly on the glare. In front of it, some idly, gloatingly watching, some busily pillaging a grocery establishment by the aid of the welcome light, was a little crowd of people.

I recognized the type of them at a glance, and when Rita pointed to a name plate on the corner of the burning building, we knew where we were. The crowds of ghouls were typical larrikins, for the most part, and "George-street" was the name on the wall.

We had landed in Sydney—the beautiful wonder-city of Australia—and found it a chaos of ruin and death.

As quietly as we could, we joined the group of idle spectators and put a few questions to them. We had to know what had actually happened without drawing too much attention upon ourselves. Our lives were too valuable now. We could not take any risks at the hands of a lawless mob.

Fortunately, our grimy faces and my unshaven chin, oddly matched with the obviously new and ill-fitting clothes we wore, proved to be in our favor. The crowd took us for homeless refugees, reckless looters, like themselves.

We quickly had our worst fears confirmed. After establishing themselves in a camp in the Blue Mountains, and defeating several attacks upon them, the Troglodytes had become angry and had decimated the chief cities of the Commonwealth.

"They put Melbourne under gas a week ago," said the most readily spoken and respectable-looking of our informants. "Where have you two been lyin' doggo, that you're so all-fired ignorant? Wal, they have smoked out Adelaide, Newcastle, Rockhampton, and a few more places, and two days ago it was our turn. We had been warned, and a good many took to the cellars and home-made gas masks, or it would have been a complete cemetery at this moment. Gosh! I wouldn't like to count the dead as it is!—and the fires—and the plunder! The place is Hades—lor' an' order gone by the board. Nothing to eat except what you can collar for yourself. Lord!" He went rambling on, telling us gruesome details of the things he had seen. He talked so fast, we could scarcely follow him at times, and in a lot of what he told us, we had no interest.

At all events, it was clear that the devastation caused by the Troglodytes had completely paralyzed the life and transport of the community—far more completely than any war or industrial stoppage could have done—and that it was a case of every survivor for himself.

"You kin guess we aren't standing much on ceremony—those of us who have come through alive," he said. "If civilization is going to smash all around, we have still got appetites and muscles left. It's going to be the rule of the strong arm over again.

"Look at me. Came from Arkansaw twelve years back. Forty years old last week. Yesterday or the day before—or was it a century ago?—a manager in that blazing pile opposite, with a wife and one kid in a natty bungalow plumb overlooking the harbor. Cloud of gas came along, wiped 'em out. I was at work here, got telephone message, tore my hair out in chunks, raved. They handed me a mask and rushed me into the basement along with others, and here I am.

"You see me—just a lone man, with nothing but a tough constitution, a couple of good arms, and a handy little gun. Do you think I am likely to starve as long as there's any grub to be had Do you think I care a red cent for anybody or any old law on this earth? No, sirree! I killed a man only this morning—I killed him—me—me—Jonas T. Hopkins, a respectable suburbanite—wiped him out without a tremble, just because the skunk fancied he had a right to the bakery he had squatted in. Lord! It's the rule of the strong arm again; the lonely, desperate man shall be boss of the earth!"

Looking at him, we could well believe his tale. It rang true. He was tall and well built, his dust-grimed clothes had a fashionable cut. A man whom wealth and luxury had not enervated—a man made desperate by the loss of everything he loved and prized—a man to rely upon if one were in a tight place.

"Mr. Hopkins," I said, taking a sudden resolution, "come along with us and have a quiet talk. We can tell you something that will open your eyes, give you a new interest in life. You are just the man we want."

My manner impressed him. Staring, he was about to answer, when Rita gave a sharp cry, and the people round began to run in panic.

The great outer wall of the burning building opposite, charred and smoking, was lurching forward to its fall. As the crowd scattered, it hung, at a dreadful angle, over the street. It loomed over us, as though overshadowing its marked prey.

We ran as it fell. It was the fleetness of our limbs against the terrible quickness of gravity.

I realized, in the lifetime of the fraction of a second, that escape was well nigh impossible.

We Enlighten Mr. Hopkins

THERE was an open stone-arched doorway, and for this we raced. I reached it first, Rita close on my heels. Hopkins was third, but as we jostled together, he pushed us aside roughly and dashed under cover before us.

It was an example of primal, individual selfishness, and nearly cost us all our lives. We sprang inside only just in time—just as that avalanche of bricks and mortar, and metal and woodwork, fell with a deafening roar, choking us with its cloud of dust.

The archway, luckily, held under the shock, though a corner of Rita's new coat was pinned between the side of the door and a heavy mass of rubbish, and had to be cut away.

"I should have been sorry if you two had come to grief; I really should," said Mr. Hopkins, as soon as he could get his breath. "But I don't beg any pardons. It's every man for himself, and I'm not reckoning to carry along on Sunday-school lines. Next thing is to get out of this."

"It won't be very easy," said I, coldly. "This doorway seems to be walled up on the inside, and the stuff outside has almost walled us in. We shall have to dig our way out, and you have got to help."

"But first, Mr. Hopkins," said Rita, smiling at the egoist, "in spite of the unfriendly way you behaved just now, let me say that I believe you are really a decent sort of man, and that you are likely to be of great use to us. We will tell you the details later on if you agree to help us, but, to shorten a long story, we have just dropped into Sydney per parachute, having jumped out of an airplane that brought us from South America.

"We have been prisoners of the strange beings who are causing such world-wide havoc. You don't know where they come from, but we do. They have come out of the interior of the earth. We have been down there, and we have discovered that they want unlimited supplies of slave labor to work their deadly mines deep in the globe—mines where the material for the poison gas is mined, where radium ore is quarried. We have been down in that underworld, and we have escaped."

Mr. Hopkins looked at Rita Courtney, and then at me. He didn't whistle; he didn't smile.

"Say, that's a tall yarn!" he remarked. "If it's true, you've got Münchhausen licked to a frazzle. But after all the things I've heard and seen lately, I guess I can swallow it. Especially if you can trot out any evidence."

"We can prove it up to the hilt," I said, and for the first time since leaving the underworld, I began to realize the difficulties we might meet in making folks believe our well-nigh unbelievable story. "Anyhow, those are the bare facts. We have not been prisoners for nothing. We have found out quite a lot about these fiends, who are ravaging and destroying over half the world, and, most important of all, I think I have discovered a way to fight them with their own weapons. I think I have discovered the secret of their method of dispersing the poison clouds made by their infernal gas bombs."

"For God's sake, don't go back on that, partner!" he cried. "Stick to it—prove it! They killed all I had in the world, and I'd do anything to help you fight them. Allowing your story is all square, where do I come in?"

"Here," said I. "Some apparatus and diagrams that I need for testing my discovery are locked up in my rooms in New York, and, if the world is to be saved, if these invaders are to be fought and defeated, I must get back home as soon as possible. I am Max Harding, newspaper man on the *Daily Scoop*—here's my card, rather grimy and dog-eared. This is Miss Courtney, also a journalist. We were sent out to Brazil at the outbreak of this business, were captured together, and have been through a toughish time. We think ourselves fairly capable, but a little help would be useful just now. You know Sydney well, and no doubt you also know your way about Australia. We want to get a ship of some sort. Money will probably be needed. Perhaps you can lay your hands on a trifle. Are you in with us? Don't hesitate to say no if you doubt our yarn. We shall have to do our best without you in that case."

"Mr. Hopkins, you simply must believe us—we couldn't possibly have made up such a story, could we? It would be senseless, wouldn't it?" Thus Rita.

Hopkins stared hard at us for a few moments. I could see that Rita's feminine appeal and feminine logic moved him far more than my own poor efforts. I could also read in his face the first dim wonderings about us two, about the relationship in which we stood to each other. How often, afterwards, as our tale was told, did I read that dawning curiosity in other faces!

"Miss Courtney, Mr. Harding, I'm your man!" he said at last, very solemnly. "It's up to you to tell me more, to bring out the proofs as we go along. I can put you on to the cash easily enough. There's a nice little deposit I had already got in view, only it was food everybody wanted first. Shake! That's good. Now for outside."

We set to work on the fallen rubbish, and at length made our way out to the debris-littered street. Though some of the city larrikins had returned to bask in the heat and light of the dying fire, nobody came to help us. It seemed that in this city of ruin and anarchy, men were fast losing their social instincts.

Where the store of money was to which Hopkins led us, I need not specify, nor at whose gunsmith's we armed ourselves, nor at whose food shops we satisfied the sharp needs of our appetites.

The persons whose property we annexed were all dead, he assured us, and we did not cross-examine him. It was good to feel well fed once more, well dressed, well armed, and with sufficient money to take us across the world.

I did mention to Hopkins that we ought to try to get in touch with the Australian Government before

we looked for a ship, but he merely pulled a wry face.

"Your poisoners scared the Government away early," said he. "Bomb fell on Parliament House. Last I heard there was some sort of palaver way up at Grafton. Wires are down, bush swarms with unemployed and refugees have turned outlaws. No, best look after ourselves and try to get passage to some place where things are normal. I found a radio set in working order yesterday, though the "A" battery was nearly down and out, and got the fag-end of a message from New Zealand. Boats are still running from Wellington on several ocean routes. Anyhow, here's daylight at last."

After the dismal night, a glorious day dawned over the ruined city, and with a fresh sea breeze putting new life and hope in us, we went down the deserted streets to the great harbor.

I shall never forget that panorama of land and water, the most wonderful and beautiful sight, some say, on all the earth.

And yet, though we saw it, we had just then no regard for the lovely vision of land-locked sea, sandy islets and wooded shores, calm and sunlit behind the sheltering Heads beyond which the restless Pacific foamed.

We were looking for a ship, and along the whole quayside there was not one!

No Safety on the Open Sea

"YOU see," explained Hopkins, "every critter that could get aboard any sort of craft stampeded to the harbor when the Trogs were first sighted. A man who was in the thick of it and couldn't get away, told me a few details.

"It was a raging fight. The mob was as senseless as a herd of wild bison. Every vessel that could be got at was packed like a sardine can, and a lot of the rowboats were swamped and capsized.

"The blamed newspapers had put the fright into folks for weeks beforehand with their scare headlines. The man I'm talking about says he went down again after the poison cloud had passed over—the rain helped to clear it away—and got into the cable office yonder. We won't go in again, thank you. There was only one chap there—a shriveled mummy, he was, one hand on his tapping key and the other clutching a piece of note paper.

"Died at his post. What price the Roman soldier paid at Pompeii, eh?"

"But there are some ships anchored out in the harbor," said Rita. "We must find some way of getting to one of them. Don't waste time talking; come along."

Woman, sentimental, yet ever practical!

It was a weary quest, but eventually we discovered a boat round which were grouped four shrunken bodies. The gas had overtaken them in the very act of embarkation. We pushed her out, threw in our belongings—some tinned foods, a keg of water, a few extra coats, and the clips of cartridges—and jumped in ourselves.

The quay appeared deserted, but no sooner were we in the act of pushing off, than a half-a-dozen wild-eyed men came out of nowhere, begging to be allowed to go with us.

"Better have them along," said Rita. "We shall need help."

"Come along then, you huskies!" cried our friend. "We'll take you as our crew, only don't forget that we are the bosses."

They accepted the situation eagerly, and helped us to row our heavily-laden boat out into the harbor. The first useful craft we boarded was a thousand-ton coaster, her bunkers and boilers full, the ashes still grey in her grates, her dead crew still on deck.

"Guess they thought they were safe out here—and went on thinking so till it was too late," observed Hopkins.

"Well, it's over the side with them, my huskies; no time to be squeamish."

By tacit consent, Mr. Hopkins assumed the rôle of captain. Not one of us was a sailor, but we all had plenty of horse-sense and knew a bit about machinery. In just over an hour, having stoked up, oiled and started the engines and got up the anchor, we began to move.

Our idea was to creep down the coast, probably as far as Melbourne, and if conditions were normal there, get some sort of official help.

They gave me the wheel, and it was with considerable pride and considerably more trepidation that I took it and my courage in both hands and prepared to navigate the Chump down the harbor to the open sea.

Rita, now very suitably attired in engineer's overalls, her dainty head piquant under a peaked cap, was at my side.

"I'm afraid you will be tired of me before this voyage is over, Mr. Harding," she said. "But, you see, I'm the only woman aboard. I don't know anything about the others, but I do know I can trust you."

"Of course you can." I kept my eyes grimly on the narrowing channel of blue water. It was good to have a valid reason for not looking too long into her own. "But why so formal, so stilted? Why so much Mr. Harding? What's wrong with my first name?"

"Nothing—Max. Silly of me to have been so stiff, but that's always been rather a failing of mine. Now, John was always John, ever since I first knew him, and I expect he will be John to the end of the chapter. Poor old John! I wonder what he is doing just now? Of course I know we did right to come, that he did right to stay behind to carry on his wonderful work down there in that dreadful cave-world, but it almost seems as though we had deserted him."

John, always John!

"What worries me more is the thought of what may be happening to poor Dick," I said, still keeping my gaze fixed on the ship's course. "We must get home, we must defeat the Trogs; and I pray we are in time to save him."

"And so do I, Max," Rita seemed somehow softer voiced, more adorably feminine, now we were at sea. "Of course, we must think of Dick Martin. I want us to save all we can. But, you see, I've a special corner in my heart for dear old John."

Was the jade deliberately harrowing my finer feel-

ings, trying to rouse my worst passions? Hang dear old John!

It was well that I had all my work cut out steering the Chump between the Heads. It was a good thing that I was finding all my sea-skill (gained in a couple of yachting summers) taxed to the uttermost. How I navigated that harbor and that channel and gained the open Pacific safely, I don't know. I never shall know. I did it—that's all.

But the doing of it kept me from saying things that I should have regretted for many a long day afterwards. So it was a good thing the Chump kept me occupied in a grim silence till we were clear of immediate danger.

"Safe out at last," I said then.

"Look there!" cried Rita, clutching my arm suddenly. "Are we never to escape them?"

A couple of airplanes had come in sight overland. A glance showed us that they were Troglodyte vessels. One sank towards the smoking city, the other made a sweeping curve and came out to sea.

"They've seen us!" shouted one of our scratch crew. "We'd be better ashore. Put back. Take us back!"

The Sea Fight

HOPKINS, who had been supervising the engines, came up from below.

"Cut out that stuff, son!" he stormed. "I've a good automatic here, and the first quitter quits—see? I'm going to let her rip. We are going to race for it, and if we die, we die in blue water. Keep her nose southwest, Harding."

"Mr. Hopkins is right," said Rita, ostentatiously fingering her own weapons. "I'm standing by him. And there's no certainty that they have seen us."

Whatever they thought, our crew were cowed into submission, and the Chump went on. Her engines worked splendidly, and, under a reek of smoke that would have done credit—or discredit—to a big liner, pushed her impudent snub nose through the long Pacific swell.

Twenty minutes passed in uncertainty, and then our slight hope vanished. There was no doubt about it. The Trog vessel, after several wavering meanderings, settled down in obvious pursuit. Through our glasses we could see some of the grotesque figures on her upper deck, pointing and gesticulating towards us.

It was galling, maddening. After all we had suffered, discovered, ventured, accomplished—when our lives might mean so much to the world—were we to be poisoned here in the open sea Or, worse, were we to be made prisoners again and taken back into those gruesome realms of night deep in the earth?

An hour passed, and, though now it was evident that the Trogs were actually pursuing, they did not appear to be gaining upon us at all.

"Can't reckon it up," said Hopkins. "From what I've seen, as well as from what you've told me, their craft could make rings around the Chump. They could put us under gas even from their present distance. What's the idea?"

"I think I can tell you." Rita spoke with sudden vexation. "They are just following us to see where we are going."

"Don't see why," snapped Hopkins, irritable.

"The Trogs are wonderfully clever, especially down at home in their cave-world," explained Rita. "But up here they are somewhat blundering and very ignorant. They can't have much idea of our world—of its extent, its distribution of land and water. The immense areas of ocean must astonish them greatly. Only the speed and staying power of their radium engines have enabled them to get about the world at all. They have no maps, they know nothing of the compass (at least, so I think); they just have to feel their way about in a haphazard fashion. It must have occurred to these particular Trogs that we, setting out so determinedly, had some definite destination in view. They probably think that we shall lead them to some land as yet unknown to them.

"And that's precisely what we may do—and, anyhow, whether we go on towards Melbourne or Hobart, or whether we turn back and try to make New Zealand, we shall be taking death and destruction along with us."

Mr. Hopkins was stumped for a moment.

"Thought I was a cool hand, but you two beat me," he went on. "What shall we do now?"

"We shall turn about and head for New Zealand," said I. "That is, if the Chump can make it, and our grub will last out. It's a longish pull, and they may tire of trailing after us. We may be too small game for them to waste gas upon. We may give them the slip in the night. And New Zealand, according to the wireless news you heard, is at least 'carrying on' yet. Don't you agree, Rita?"

"It's all we can do, Max," she said, with a shrug of her shoulders. "We can only go on, and trust to the God or the Fate that has favored us so much."

So the Chump held on, pounding away eastward, the Trog air-vessel following, exactly matching her speed with ours. When the bowl of the southern night sparkled with its brilliant galaxy of stars, we ran without lights, with choked fires, hoping against hope to find our pursuers gone when day came.

"No such luck, no sirree!" growled Hopkins, standing near me as the sun rose in glorious splendor over the restless waters. "There they are, just at the same distance. If only this was a U. S. A. battleship, and we could put a shell under the blighters! We can only go on and twiddle our thumbs at them. This one-eyed hulk hasn't even a wireless aboard—we can't even send out an S. O. S.!"

"No need, Mr. Hopkins," came Rita's clear voice from forward. "Just look over here. Several ships over the horizon—one, two, three, four."

As the flotilla came nearer, we made out that one of them was undoubtedly a warship, and our spirits rose. One of our crew found a signaling book, and we lost no time in getting into communication as soon as we were near enough. We learned that the warship, H.M.S. Cruiser Rockhampton, was convoying a mail steamer and two food ships from Wellington to Sydney, with a view to helping the survivors.

"Better turn back with us!" I shouted, when we drew alongside the cruiser. "Australia is completely disorganized and at the mercy of strangers. Your ships should scatter, instead of crowding together, if you don't want this fellow that is following us to wipe you all out at once. Look out; they mean business!"

I had heard a sharp report, like the crack of a heavy whip, and knew what that meant only too well.

The Trogs had commenced hostilities.

The bomb struck and burst upon one of the supply ships. The vessel was quickly enwrapped in the black, low-hanging cloud. It clung about her, hiding her from sight. She was suddenly a derelict, a ship of poisoned dead.

The mail steamer was the next victim, but she had some little way on her and escaped some of the gas. We saw a white cloud fighting back the black.

"Sousing it with steam jets! Bully!" cried Hopkins. "Better get our pipes ready!"

Just then came the third report, and the third bomb found its mark on the cruiser's quarter.

The Trogs had now come rather low down. They had not yet fought an ironclad, I expect, and were not reckoning on H.M.S. Rockhampton.

With full speed on, the cruiser drove clear of the rolling fog, and next moment came the roar of her forward barbette. The shell screamed through the air straight to its mark, smashing one of the Trogs' side planes to fragments.

The stricken airplane fired another bomb, and leaped upwards.

"Too late! Hurrah!" shouted Hopkins, dancing about in wild glee. "That's a real tonic! That's the goods! No more gassing from that little lot!"

H.M.S. Rockhampton had fired every gun she could bring to bear on her enemy, and in a blaze of rending destruction, the Trog airplane had vanished. She had become a rain of fragments, falling into the sea.

A great cheer went up from all hands. From the cruiser a boat put off towards the Chump.

"Now we are up against one of the stiffest propositions of all," said I. "We've got to give an account of ourselves—we've got to convince the official mind of the truth of our story—and we've got to have official help. It won't be easy."

Panic

WITHIN twenty minutes of the destruction of the Troglodyte air-vessel, we three were aboard the Rockhampton, and the convoy was on its return journey.

We had convinced Commander Jackson that it was worse than useless to put in at Sydney, and had impressed him very forcibly with the earnestness of our desire to go back with him; but when it came to the details of our story—well, we were "up against it."

Nevertheless, we shook him out of his smiling skepticism at last, and made him realize our sincerity and good faith.

Rita was our trump card. Hopkins was too headstrong, too impatient, too full of expletives. For my part, the tale I had to tell sounded unreal and fantastic even to myself.

But the Commander was a handsome man, on the sunny side of 40, a ladies' man, and Rita's brilliant smile, when she settled to work upon him, broke down his defenses at the first assault.

"I know it's almost unbelievable, Commander. If we hadn't been through it ourselves, it would seem a fairy story to us. But it's all true, and you must see that it fits in with everything you know. You haven't even any theory to account for these Troglodytes, whereas we have penetrated to their place of origin. And I have brought proofs."

Hopkins and I craned forward. This was the first we had heard of any proofs.

From the bead bag which Rita carried, and which she had somehow managed to retain through all our misadventures, she produced three objects—three small objects.

She displayed them on the table.

"This is a flame pistol, one of which every Trog carries for use in the last emergency. Its effect we have told you. It contains one charge only—a single release of atomic energy. For heaven's sake, don't play with it! This is a small poison-gas bomb—you can experiment with that when you like. And this"—unwrapping a roll of lead and disclosing a dully glowing knob of curious-looking metal as big as a walnut—"this is a piece of pure radium from the Troglodyte mines. We mustn't handle it, or leave it uncovered long. There isn't so much in existence in all our upper world."

The Commander looked at these exhibits keenly. Then he looked into Rita's eyes. It seemed to me that it was what he saw there that was really the determining factor in his conversion.

Then Rita went on to tell of my discoveries, and my hope of being able to defeat the Trogs eventually. He wrenched his gaze from her face, turned to me, and grasped my hand across the table, impulsively.

"If you can do that, Mr. Harding, how I shall envy you! You are greatly to be envied as it is! To be associated with Miss Courtney as you have been—what a wonderful privilege!"

I could read his thoughts without any psychic power. He was wondering, as so many would wonder, how we stood towards each other, she and I.

"Well," he went on, "we must get you to America as soon as possible. You are needed. Just let me tell you the general situation, as far as I know it at the present moment, and you will see that you didn't make your miraculous escape a moment too soon.

"The menace of the Trogs, as you call them, is the chief item of interest, and has precedence on all cables and all radio news. The terrible unexpectedness of their destructive raids is one of its worst features. No one, anywhere, feels really safe.

"After devastating much of South America, they have established camps, or centers, at the Cape, in Australia, on one or two Pacific Islands, and one large depot near Panama. Exasperated at the attacks made upon them, they have paid flying visits to Mexico and

the United States. Baltimore and Chicago have been smothered under poison gas, and many prisoners scooped up.

"What they took prisoners for, of course, nobody knows, but these sudden and apparently haphazard attacks have completely demoralized large sections of the population. The blacks have almost got out of hand. They are either running amuck, killing and burning, or they have ceased to work and give themselves up to orgies of religious fanaticism.

"The terror hangs over America like a thundercloud, trade is paralyzed, credit is falling. Till recently, there was a frantic emigration to Europe. Everybody feels insecure, anxious to hide or to run; nobody trusts the banks, nobody will speculate. People are privately hoarding money, valuables and everything useful, preparing for the chaos they expect when the big cities and Governmental centers are destroyed.

"Of course, all Governments are furiously at work on speedy aircraft, long-range guns, and so on; people are digging gas-proof shelters, and gas-masks are being manufactured by the million."

"Not much use against the Troglodyte poison, as they will find," said I. "But what about Europe? Surely that is carrying on normally?

"I was coming to that. Of course the disaster to America has had unpleasant repercussions in Europe. What little hope of revival, of improvement, there seemed left after the Great War and the industrial troubles, has quite gone. And to put the finishing touch to the tale of tragedy, the Trogs have crossed the Equator and entrenched themselves in a big camp in the Atlas Mountains. They are raiding Morocco and Algeria, where the panic-stricken Moors, Riffs and Kabyles are up in arms again, and the last official news I heard was that Barcelona had been destroyed. Rome, Paris, London itself, are living in daily dread of the fate that may fall upon them out of the sky at any moment.

"Mr. Harding," he added, "I fervently hope that your story is true, and that you can do what you say. God grant that it be so!"

Silence fell upon us. The awful picture of a terrorized world was even worse than we had feared. We did not think the Trogs so energetic, so daring, so utterly callous, even after our experiences underground.

"These brutes must be very numerous," said the Commander. "Is this nether world you speak of really very extensive?"

"To the best of my belief, gathered from scraps of information pieced together," said Rita, "the cave-world's deep passages and openings extend for many hundreds of miles in all directions from the Outlet. It is a long journey for one of their small airplanes to traverse the length of that honeycomb region. Oh, we must do something quickly, Captain! We must get home before it is too late!"

"You must!" said the Commander. "We must wireless news of your escape and your project at once. As soon as we reach Wellington, things should be moving. You have a tremendous responsibility, but I am backing you for all I am worth. At a time like this I don't think any Government—least of all our own—could afford to neglect any hope, however slight."

He rang a bell, gave orders for full speed ahead, dictated messages to all wireless operators, and packed us off to the cabins at our disposal for rest and change of clothes.

I remember, as I luxuriated in the long-missed necessity of a hot bath, that I was thinking far too much of Rita Courtney for my peace of mind, that I was glad still more strenuous and anxious days were in store. I even welcomed the heavy rolling and plunging of the cruiser as we ran into a heavy storm—anything to keep my attention in the present—anything to divert it from the empty, lonely future that loomed ahead.

A Rush Across the World

OF the happenings of the next two days, we have none of us anything except a jumble of confusing memories. There was so much to be done, we had to pack such a lot of hard work into such a short time.

I know we reached Wellington safely, although we were delayed by the storm; we were met by excited pressmen and no less excited crowds; we were summoned to a hastily convened meeting of the Cabinet; and told our strange story over and over again. I know we were honored and banqueted and interviewed and believed and ridiculed. I know we made such a good impression on the people who matter—the people who can pull the strings—that our speedy transit home was assured.

But the details? Don't expect me to go into details! Crowds, meetings, dinners, arguments, speeches to the microphone, speeches to reporters, headlines in the papers, sore throats, tired bodies and weary minds, talks with wireless inventors and experts at all hours of the night—mix the lot together and take the dose!

Yet, fagged out as we were, our urgency allowed us no rest. We were too anxious to be on the move, and our first real spell of idleness and ease came when we settled in the comfortable cabin of the Australian Airways vessel No. 2, *en route* for India.

The airplane, one of the finest of the many aerial vessels now flying on the regular Empire routes, roared us along at a steady speed of over 100 miles per hour. Flying high above Australia, we saw little of the havoc there. We had already seen enough. Without mishap we reached Bombay on schedule time, and were handed over to the next pilot, who would land us at Port Said for the third and last stage of our rush across the world.

"Aerial travel—if civilization survives this last attack—will alter all one's ideas of distance," said Rita. "Aerial travel, combined with radio news. Here we are, rushing over land and sea, at about two miles per minute, getting news as we go along, hearing what people are doing, what they are saying about us, knowing that people everywhere are listening to news of us, thinking about us, knowing exactly where we are, waiting, hoping. It is more wonderful than any dream!"

"And when we have defeated the Trogs," said I, "and can utilize their radium engines and make our

airplanes into reliable helicopters—we shall look back on these days as very slow and old-fashioned."

"Almost as old-fashioned as a woman journalist ought to be, but isn't, Max?"

"I guess the lady got you in the solar plexus that time, Mr. Harding!" grinned Hopkins. "Wal, this sitting still and watching the earth spin under you is O.K. for a change, but I gotta hunch that we shan't see home any too soon. The beggars seem to be getting too busy. Last item sounded nasty. They've been seen over Italy and Egypt. Hope we don't run into any of 'em."

We had made good going up till now—had outflown winds and storms, and suffered no delays from engine trouble, but the luck was too good to last. Running alongside the Suez Canal, flying low over the desert sand, we noticed a slackening of speed, a change of note in the roar of the propeller.

Suddenly the engine misfired, the gearing screamed and groaned, and, with power shut off, we swooped abruptly to earth. We grounded with a jerk, but without sustaining any other damage than a few severe bruises.

"Oil case sprung a leak—bearing run dry—propeller shaft seized—only stopped her in the nick of time—afraid she's too sprained to carry on without repair—can't send out a call now she isn't running—don't know what you'll do—have to look for a ship coming through—Canal over there, not a mile off."

The chagrined pilot flung these terse remarks at us, lit a cigarette, and sat down on the sand under the shadow of one of the wings.

"I've got to wait here for the next bus passing. You'd better be moving, you three."

"Come along," cried Rita. "He's right. We must get a ship as far as Port Said. Once there we shall be able to take to the air again—if we are not looked for earlier. They are sure to send some one to see why we are behind time, why we don't speak."

We tramped across the hot sand towards the distant line of blue water. The stop was very annoying, but we were not greatly alarmed. In less than two hours we were picked up by a big British cargo steamer going north.

"Funny thing, but our wireless is out of order," said the captain, after wonderingly listening to as much of our story as we thought fit to tell him.

"We shall have to wait till we get to Said—or till we meet a ship coming down. And that's funnier still—we've not met one all day! The Canal seems too quiet. I wonder if there's been a jam or any accident!"

We couldn't tell him anything about that, of course, but I had a very uncomfortable suspicion of what might have happened. And it wasn't long before we knew, before we realized that our delay had either cost us a lot of time or saved us from irretrievable disaster.

The Trogs had put a cloud of poison gas over Alexandria, Port Said, and the Mediterranean mouth of the Canal. Two of their queer-looking vessels, rising rapidly as they flew, passed over us at a great speed, swerving southwestward.

Miles away from the usually noisy and busy port, we saw the black cloud rolling over the level land and sea, rolling in thick masses that loomed horribly black under the fierce white sunlight of the day.

The silence was ominous, eerie; as in the darkness that once fell upon Egypt, this was a silence that could be felt.

END OF PART I.

The Menace

By DAVID H. KELLER, M.D.

OUR well-known author, who has endeared himself to the hearts of AMAZING STORIES readers, has written a series of unique stories for the QUARTERLY. The four stories may be read separately, or in a series. It would be useless to attempt to review them in a preface of this kind. The only thing we can say is that these four stories are chock full of interest, and contain an excellent amount of science, very cleverly interwoven.

A great many new ideas are brought out in these four stories. Although all the four stories are definitely connected, each treats of an entirely different theme and can stand alone.

While a prominent detective assumes an important role throughout this series, they cannot be called detective stories in the usual sense of the word.

We promise you a lively time with these stories. They will not fail to keep your interest, and you will follow the adventures of the arch villains breathlessly until the end.

This story is published in the *Summer Edition* of AMAZING STORIES QUARTERLY now on sale at all newsstands

Out of the Sub-Universe

By R. F. STARZL

EVERYTHING in this world is relative, with or without Einstein. Even time is relative. As Benjamin Franklin pointed out, the Ephemerid fly lives only twenty-four hours; yet leads a normal existence. During those twenty-four hours, it lives a full-time life, which, to the fly is of the same duration as a 60 to 70 year old life led by the human being. So too, is it with a microbe or microbe organism, which lives only a few minutes and then dies. These few minutes constitute a normal cycle. It simply lives much more quickly, although it does not realize it.

You can conversely imagine a race of human super-beings on some other planet, which normally would live perhaps 10,000 years, as computed according to our time. To them a few years of allotted life would be incomprehensible.

Here is a charming story which contains excellent science and will teach you a great deal about the atomic world, if you do not know it already. Also, it contains that most elusive jewel—the surprise ending.

This story is published in the *Summer Edition* of AMAZING STORIES QUARTERLY now on sale at all newsstands

The ANANIAS GLAND

By W. Alexander

Author of: "New Stomachs for Old," and "The Fighting Heart."

"This is my pocket X-ray and if you will bend your head, I will make an examination of a certain gland located in the back of your head.

DR. ARTHUR WENTWORTH stretched his long legs out before the glowing log fire in his library and as he listened to the beating of the rain on the window, thanked his lucky star that he had now reached the place in his profession, where his medical practice was confined to his office and the hospital. Through the performance of many unique operations, in which he frequently transferred vital organs from one person to another, with good results, he had gained an international reputation.

THE present story might be termed "An Excursion into Lighter Psychology." It holds up the average human being in a most surprising light. We do not often stop to think of all of our actions, good, bad or indifferent, and even the most honest and fair-minded of us might do well to read the present story and profit therefrom.

He was just becoming absorbed in an article in the current number of the *Medical Journal,* when his man entered with a card.

"I have shown the gentleman into the front room, sir," said the servant, "as I was not sure that you would care to see him."

Dr. Wentworth glanced at the card which read: "Geo. F. Ballinger, University Club." He remembered the man as a very casual acquaintance at the club.

"Show him in, Hawkins," he said, with a sigh of regret as he replaced the magazine on the stand, "but unless his visit develops something of unusual interest, I shall certainly penalize you for allowing him to spoil my evening. I wonder if that greenback I see protruding from your vest pocket had anything to do with causing you to break our rule of, 'No visitors in the evening without an appointment.' "

He smiled to himself as the faithful Hawkins made hurried exit clutching wildly at the betraying greenback.

In a moment a well groomed man with a fine, intelligent face entered and as he shook hands said:

"I must apologize Doctor, for taking the liberty of intruding on you at home, but the fact is that I am not at all sure that I am calling on you in your professional capacity. I think it must have been your reputation for being a big hearted man with a wise head and a ready hand for a man in trouble, that induced me to call."

"I am afraid you exaggerate my reputation, Mr. Ballinger," replied the doctor, very favorably impressed with his apparent frankness and sincerity. "But be that as it may, I judge from your remarks that you find yourself in some kind of trouble. Tell me all about it; perhaps I can help you."

"As you may be aware," Ballinger commenced, "I have been very successful as a stock-broker. I am now thirty-five and in the ten years since I left college and entered business, I have amassed a considerable fortune. My wife and I have the *entrée* to the best society in the city; we are both in good health, and by all rules we should be extremely happy and no doubt would be, were it not for the skeleton in the closet. The nature of this skeleton, I am almost ashamed to confess to you.

"I am a liar Doctor, an unmitigated, persistent, though unpremeditated liar. I lie when the truth would serve my purpose much better. I cannot describe the most common incident, I cannot answer the simplest question, without being overcome with this uncontrollable impulse to lie. Time after time this failing has caused my wife great embarrassment, until now she says she will leave me if I do not stop it. But stop it I cannot, try as hard as I may. Even as a boy I was inclined to exaggerate at times, but now it has grown on me until it has crept into my business dealings, causing me to lie continually even to my associates. There is no sense, reason, or method in my lies. Only on rare occasions has it benefitted me financially; generally it means a severe financial loss. I have always prided myself on being absolutely square in business, but in the past six months these unpremeditated lies have caused my business associates to look on me with suspicion and my social acquaintances are now looking at me askance. Is there anything that you can do for me Doctor?"

"I will be able to answer that question in just a minute," said Dr. Wentworth, stepping to a wall-cabinet and returning with a small nickel-plated affair, with an electric-cord attachment, which looked somewhat like a small flash-light. He attached the cord to a lamp socket. "This is my pocket X-ray and if you will bend your head, I will make an examination of a certain gland located in the back of your head."

After making a thorough examination, he replaced the X-ray device in the cabinet and resumed his seat.

"Your condition, Mr. Ballinger, is about as I suspected. Not being a medico, you are probably not aware of some rather startling discoveries made by scientists quite recently, which exactly apply to your case. It has been learned that the closeness with which a person adheres to truth, depends entirely on the condition and development of a ductless gland located just below the medulla oblongata, in the back of the head. This gland they have quite properly named the *Ananias Gland*. My X-ray shows that you have an abnormal development of this gland, the only remedy being an operation to reduce it to normal size."

"Your words are an immense relief to me Doctor," said Ballinger with a happy laugh, "for it shows that I am not really responsible for my lies. I have lately had the fear that I was really crooked at heart. When can you perform the operation and for how long will it confine me?"

"I can arrange to perform the operation tomorrow and you will be confined to the hospital for not more than three days, though it might be well for you to take a rest for two or three weeks afterwards. I should advise you to let it be known among your acquaintances, that you are having an operation for the removal of your tonsils. It will save you embarrassment."

The operation was performed the next day and that it was a success was proven two days later when a friend of Ballinger's called at the hospital to see how he was getting along.

"Well old man, did you get rid of the old tonsils?" he asked.

"No," Ballinger replied, and was about to explain that it was a gland that had been operated on, but was interrupted by Dr. Wentworth, who happened to be in the room.

"He means that he doesn't know what we did to him," said the doctor with a laugh, "except that he has a very sore throat. I expect it would be just as well if he did not try to talk for a few days."

AFTER being released from the hospital, Ballinger ran down to Palm Beach and spent two weeks golfing and swimming, coming back to his office at the end of that time feeling very fit.

It was not long after his return that he realized that he had been cured of lying with a capital "C." Where formerly his lying had been beyond his control, in the same measure now was his truthfulness uncontrollable.

One evening he and Mrs. Ballinger were to attend a dinner-party and when her maid had dolled Mrs. Ballinger up to the *nth* degree, she joined him in the library, feeling quite proud of her appearance.

"How do I look? What do you think of the new dress?" she asked, pirouetting slowly that he might view all sides, anxious as are all women, for the male stamp of approval.

"Well," he answered, eyeing her critically, "that dress with those flounces was intended for a slender person;

you are much too stout to wear that style. There are slight bags beneath your eyes and in my opinion, you have too much rouge on your cheeks and lips."

"Oh, is that so?" said she, hurt and angry. "I expect you will be ashamed to be seen with me."

"No, no, Nell darling," he protested vehemently, knowing full well that he had made the wrong answer, but unable to control that impulse to tell the truth. "You know that I love you just as you are and am proud to be seen with you."

It so happened that the guest of honor at the dinner was a nephew of the hostess, a garrulous chap just returned from a hunting and exploration trip to Central Africa. During the course of the dinner he recounted tale after tale of his adventures and it became painfully palpable to the listening guests, that he had no mean opinion of his own ability and exploits.

When the men joined the ladies in the sitting-room at the conclusion of the dinner, the hostess fluttered proudly up to a group of men of which Mr. Ballinger was one, asking:

"And what do you think of my nephew? Isn't he the most daring fellow?" The men uttered the usual banal, conventional phrases, except Ballinger, who, by a supreme effort, was keeping silent. Noticing his silence, the lady asked: "Don't you think he is just too wonderful, Mr. Ballinger?"

"I think he is a big bag of wind," he replied, the pent up words which he had been holding back now coming out with a rush. "I doubt if he has any part of the courage he credits to himself in his tales. More than likely he never was more than ten miles inland from the coast and probably read those stories in some book of fiction."

"How insulting!" said the lady, inspecting him through her lorgnette. "You will please consider yourself *persona non grata* in this house in the future."

As time went on he became more and more of a social outcast, people fearing his terrible truthfulness. Conditions at his office were no better and one morning at a meeting in his office, he lost the friendship of the remaining three of his associates, because of his uncontrollable impulses to tell the exact truth.

The four of them were holding a conference prior to the expected visit of a capitalist named Andrews, whom they were anxious to interest in their pool of a steel stock, in which they were all involved and which promised to involve them in a heavy loss unless they could get the help of this man and his money.

"Now men," said one of them, "when Andrews comes, it is up to us to sell him the idea of big profits in this Northway Steel stock pool of ours. If he knew about them passing this last dividend and how badly we need him, I doubt if he would come in."

WHEN Mr. Andrews arrived, they talked very earnestly to him of the wonderful prospects for big profits in their pool—that is all but Ballinger, who, by a most strenuous effort, kept silent. The canny Scot listened to them without comment until they had finished, then turned suddenly to the silent Ballinger.

"Ballinger," said he, "you know more about Northway Steel stock than any of these men, for you have been heavily interested in it for several years. Are they paying their dividends regularly? Do you consider this pool a safe investment for me?"

"They passed their last dividend," he answered, to the horror of his friends, "and it is not what I would call a safe investment, but we need you badly to join us, for if you don't, we are in for a heavy loss."

"Thanks, Ballinger," said Andrews, walking toward the door, "you are one of the few absolutely truthful stock-brokers, but Northway Steel is not my kind of investment."

There was a moment's silence after the door closed on the retreating Andrews, then they opened up on Ballinger and what they told him was, for the most part, entirely unprintable. All he could answer to their terrible tongue lashings was:

"It was the truth, it was the truth."

To which one of them replied: "From being the biggest liar in Wall Street, you have become so painfully truthful that I, for one, want nothing more to do with you—and that's a promise."

Reckoning up results now some six months after his operation, he found that he had lost thousands and thousands of dollars, almost half of his fortune, by persistently telling the exact truth about various deals in stocks. His wife had left him and he was a social outcast, without a man whom he could call friend. In his extremity, he thought again of Dr. Wentworth and again called at his home.

"Doctor," said he sorrowfully. "When I called on you before, I thought my plight was as bad as it could be, but I was mistaken, for I am now a hundred times worse off than then. From being a very big liar you have changed me to the most truthful man in the world. The change has cost me my wife, half my fortune and all of my friends. I am convinced that the world has little use for a teller of truths."

"Why that is bad," said the doctor with keen sympathy. "Tell me just what happened."

Ballinger then launched into a detailed account of the hundred and one incidents that had caused his downfall, explaining that he had found it impossible to answer any question except with the exact truth.

"You should have come to me at once," said Dr. Wentworth. "A very simple operation to slightly elongate the Ananias Gland will remedy the trouble. In the previous operation, I removed a little too much of the gland, making you absolutely truthful, which will not do at all. By making the gland slightly longer, you will be reasonably truthful, but with discretion. You know David in his Psalms said: 'All men are liars.' I am inclined to agree with him and it is well, for if it were not so, society, civilization, would soon be in chaos. The man who will not lie a bit to save the feelings of another, in my opinion, is no gentleman."

Six months after the second operation, we find Geo. F. Ballinger a very happy man with a fond wife by his side, a constantly widening circle of friends and in a fair way to regain the lost portion of his fortune—but he now handles truth with an economy that amounts almost to parsimony.

THE END

The PSYCHOPHONIC NURSE
By David H. Keller, M.D.

Author of: "The Revolt of the Pedestrians," "The Biological Experiment," etc.

"I AM mad! Just plain mad!"

"Well, it cannot be helped now," replied the woman's husband. "I am just as sorry as you are about it, but the baby is here now and some one has to take care of it."

"I admit all that," said Susanna Teeple. "I want her to be well cared for, but I have my work to do and I have a real chance now to make a good income writing regularly for the *Business Woman's Advisor.* I can easily make a thousand dollars a month if I can only find the time to do the work. I simply cannot do my work and care for the baby also. It was all a great mistake, having the baby now."

"But I make enough to hire a nurse," insisted the husband.

"Certainly, but where can I find one? The women who need the money are all working at seven hours a day and all the good nurses are in hospitals. I have searched all over town and they just laugh at me when I start talking to them."

"Take care of her yourself. Systematize the work. Make a budget of your time, and a definite daily programme. Would you like me to employ an efficiency engineer? I have just had a man working along those lines in my factory. Bet he could help you a lot. Investigate the modern electrical machinery for taking care of the baby. Write down your troubles and my inventor will start working on them."

"You talk just like a man!" replied the woman in cold anger. "Your suggestions show that you have no idea whatever of the problem of taking care of a three-weeks-old baby. I have used all the brains I have, and it takes me exactly seven hours a day. If the seven hours would all come at one time, I could spare them, but during the last three days, since I have kept count, I have been interrupted from my writing exactly one hundred and ten times every twenty-four hours and only about five per cent of those interruptions could have been avoided. The baby has to be fed and changed and washed and the bottles have to be sterilized and the crib fixed and the nursery cleaned, and just when I have her all right she regurgitates and then everything has to be done all over again. I just wish you had to take care of her for twenty-four hours, then you would know more than you do now. I have tried some of those electrical machines you speak of: had them on approval, but they were not satisfactory. The vacuum evaporator clogged up with talcum powder and the curd evacuator worked all right so long as it was over the mouth, but once the baby turned her head and the machine nearly pulled her ear off, before I found out why she was crying so. It would be wonderful if a baby could be taken care of by machinery, but I am afraid it will never be possible."

"I believe it will," said the husband. "Of course, even if the machine worked perfectly, it could not supply a mother's love."

"That idea of mother-love belongs to the dark ages," sneered the disappointed woman. "We know now that a child does not know what love is till it develops the ability to think. Women have been deceiving themselves. They believed their babies loved them because they wanted to think so. When my child is old enough to know what love is, I will be properly demonstrative and not before. I have read very carefully what Hug-Hellmuth has written about the psychology of the baby and no child of mine is going to develop unhealthy complexes because I indulged it in untimely love and unnecessary caresses. I notice that you have kissed it when you thought I was not watching. How would you feel if, because of those kisses, your daughter developed an Edipus Complex when she reached the age of maturity? I am going to differ with you in regard to the machine; it will never be possible to care for a baby by means of machinery!"

"I believe it will!" insisted the man.

BEING a psychiatrist, Dr. Keller is naturally interested, not so much in the mechanical advances of the age, as in the psychological effects of these devices on the human being.

If a mechanical house-maid is possible, why not a mechanical nurse? And a mechanical sweetheart? The many advantages to be derived from such an arrangement are many, and Dr. Keller puts these forth very clearly, though satirically. The story is realistic and beautifully told, and the denouement is entirely unexpected.

That evening he took the air-express for New York City, and when he returned, after some days absence, he was very uncommunicative in regard to the trip and what he had accomplished. Mrs. Teeple continued to take very good care of her baby, and also lost no opportunity of letting her husband realize what a sacrifice she was making for her family. The husband continued to preserve a dignified silence. Then, about two weeks after his New York trip, he sent his wife out for the afternoon and said that he would stay home and be nurse, just to see how it would go. After

Let me show you how she works. She is made of a combination of springs, levers, acoustic instruments, and by means of tubes such as are used in radio, she is very sensitive to sounds.

giving a thousand detailed instructions, the fond mother left for the party.

On her return, she found her husband calmly reading in the library. Going to the nursery, she found the baby asleep and by the side of the crib she saw a fat, black woman, clad in the spotless dress of a graduate nurse. She seemed to be as fast asleep as the child. Surprised, Mrs. Teeple walked to her husband's chair.

"Well, what does this mean?" she demanded.

"That, my dear, is our new nurse."

"Where did you get her?"

"I bought her in New York. In fact, I had her made to order."

"You what?" asked the astonished woman.

"I had her made to order by the Eastinghouse Electric Company. You see, she is just a machine nurse, but as she does not eat anything, is on duty twenty-four hours a day and draws no salary, she is cheap at the price I paid for her."

"Are you insane, or am I?"

"Neither. Certainly not your husband. Let me show you how she works. She is made of a combination of springs, levers, acoustic instruments, and by means of tubes such as are used in the radio, she is very sensitive to sounds. She is connected to the house lighting current by a long, flexible cord, which supplies her with the necessary energy. To simplify matters, I had the orders put into numbers instead of sentences. *One* means that the baby is to be fed; *seven* that she is to be changed. *Twelve* that it is time for a bath. I have a map made showing the exact position of the baby, the pile of clean diapers, the full bottles of milk, the clean sheets, in fact, everything needed to care for the baby during the twenty-four hours. In the morning, all you have to do is, to see that everything needed is in its place. At six a.m. you go into the nursery and say *one* in a loud, clear voice. The nurse reaches over to the row of bottles, picks up one and puts the nipple in the baby's mouth. At the end of ten minutes it takes the empty bottle and puts it back in the row. At six-thirty, you say clearly and distinctly, *seven*. The nurse removes the wet diaper, takes a can of talcum, uses it, puts it back, takes a diaper and pins it on the baby. Then she sits down."

"I think that you are drunk!" said the woman, coolly.

"Not at all. You feel of her and see. She is just a lot of rods and wires and machinery. I had her padded and a face put on, because I thought she would look more natural that way."

"Suppose all that you say is true. How can that help me. I have to see what the baby needs and then I have to look through the book and see what number to say and then I suppose I have to stay and watch the old thing work. I wanted a chance to work at my books and this—why, it is ridiculous!"

Her husband laughed at her.

"YOU are a nice little woman, Susanna, but you certainly lack imagination. When I ordered this machine, I thought about all that and so I bought a phonograph with a clock attachment. It will run for twenty-four hours without attention. Then I had a baby doctor work out a twenty-four hour programme of baby activity for different ages Our baby is about two months old. You put this phonograph in the nursery with the two-month record on it. At six in the morning you see that all the supplies for that day are in the proper place; you see that the Psychophonic Nurse is in her proper place; the baby must be in her proper place. Then you attach the electric current to the phonograph and to the nurse and start the record. At definite periods of the twenty-four hours the phonograph will call out a number and then the nurse will do what is necessary for that hour. It will feed the baby so often and change it so often and bathe it so often. You start it at six and leave it alone till six the next morning."

"That sounds fine," said the wife, sarcastically, but suppose the baby gets wet between times? Suppose it starts to cry?"

"I thought of that, too. In every diaper is a fine copper wire. When that becomes wet a delicate current is sent—you understand I mean an electrical current, not a watery one—this current goes to an amplifier and a certain sound is made, and the nurse will properly react to that sound. We have also provided for crying. When the baby does that, the nurse will pick the little one up and rock her to sleep."

"But the books say that to do that spoils the baby!"

"I know. I thought of that. But then the poor little thing has to have some love and affection in her life and so I thought it would not harm it any to be rocked now and then. That was one reason why I had the padding made the way that I did. I bet it will be mighty comfortable-like for the child. Then again, you know I had a black Mammy and I wanted my child to have one, too."

"Well," said the woman, rather petulantly, "show me how the thing works. I have a lot of writing to do and unless I do it, they will employ some one else."

After two hours of close observation, she had to admit that the Nurse was just as capable of mechanically looking after the needs of a baby as she was. In fact, the cleverness of the performance made her gasp with astonishment. After each series of complicated acts, the machine went back to the chair and sat down.

The husband was triumphant.

"She does the work nicely," he said. "Naturally, there is no intelligence, but none is needed in the early months of child-care."

The Psychophonic Nurse performed her duties in a way that would have been a credit to any woman. Of course there were times when things did not go as well as they should, but the fault was always with the human side of the arrangement and not with the mechanical. Usually the mother was to blame because she did not place the supply of food or clothes in exactly the right place and once a new servant played havoc by cleaning the room and putting the nurse and the chair on the wrong side of the crib. Still, with a little supervision and care, things went very well indeed, and in a very short time the baby became accus-

tomed to her black Mammy and the Mother was satisfied to spend a few minutes every morning arranging supplies and then leave the two of them alone for the rest of the twenty-four hours. Every two weeks a new record was placed in the phonograph, for it was determined that it was necessary to make a change in the programme at least that often.

Mrs. Teeple, thoroughly happy with her new freedom, now devoted her entire time to literature. Her articles, which appeared in the Saturday issue of *The Business Woman's Advisor,* were more than brilliant and aroused the most favorable comment from all parts of the world. An English firm asked her to write a book on "Woman, the Conqueror," and so relieved was she of household worries, that she started at once to pound out the introduction on her noiseless, electrical typewriter. Once in a while she felt the need of exercise and would stroll around the house, and occasionally look into the nursery. Now and then she would pick the little one up. As the child grew older, this made her cry, so the Mother decided that it was best not to interfere with the daily routine.

In spite of their efforts to conceal the activity of their new assistant, the news spread through the little town. The neighbors called, and while they had all kinds of excuses, there was no doubt about what it was they really wanted to see. Of course, opinions differed, and rather sharply. There were some of the older women who fearlessly denounced such conduct as unconditionally bad, but most of the women were secretly jealous and demanded that their husbands also buy a mechanical nurse-maid.

THE news spread beyond the confines of the town. Descriptions of a most interesting and erroneous nature began to appear in the newspapers. Finally, to avoid unscientific criticism, Mrs. Teeple wrote a full account of the way she was raising her child and sold it to the *New York Comet,* fully illustrated, for five thousand dollars. At once the Eastinghouse Electric Company was swamped with orders which they simply filed for future delivery. The entire machine was covered with patents and these were all the property of Teeple, who, for the time being, simply said that he wanted to make further studies before he would consider the sale of his rights.

For several months it seemed that the discussion would never end. College debating teams selected as their subject, SHALL THE CHILD OF THE FUTURE BE RAISED BY THE MOTHER OR BY A PSYCHOPHONIC NURSE? The leaders of the industrial world spent anxious evenings wondering whether such an invention would not simplify the labor problem. Very early in the social furor that was aroused, Henry Cecil, who had taken the place of Wells as an author of scientifiction, wrote a number of brilliant articles in which he showed a world where all the work was done by similar machines. Not only the work of nurses, but of mechanics, day laborers, and farmers could be done by machinery. He told of an age when mankind, relieved of the need of labor, could enter into a golden age of ease. The working day would be one hour long. Each mechanician would go to the factory, oil and adjust a dozen automatons, see that they had the material for twenty-four hours labor and then turn on the electric current and leave them working till the next day.

Life, Henry Cecil said, would not only become easier, but also better in every way. Society, relieved of the necessity of paying labor, would be able to supply the luxuries of life to everyone. No more would women toil in the kitchen and men on the farm. The highest civilization could be attained because mankind would now have time and leisure to play.

And in his argument he showed that, while workmen in the large assembling plants had largely become machines in their automatic activities, still they had accidents and sickness and discontent, ending in troublesome strikes. These would all be avoided by mechanical workmen; of course, for a while there would have to be human supervision, but if it were possible to make a machine that would work, why not make one that would supervise the work of other machines? If one machine could use raw material, why could not other machines be trained to distribute the supplies and carry away the finished product. Cecil foresaw the factory of the future running twenty-four hours a day and seven days a week, furnishing everything necessary for the comfort of the human race At once the ministers of the Gospel demanded a six-day week for the machines, and a proper observance of the Sabbath.

Strange though it may seem, all this discussion seemed natural to the general public. For years they had been educated to use electrical apparatus in their homes. The scrubbing and polishing of floors, the washing of dishes, the washing and ironing of clothes, the sewing of clothes, the grass cutting, the cleaning of the furniture, had all been done by electricity for many years. In every department of the world's activity, the white servant, electricity, was being used. In a little Western town a baby was actually being cared for by a Psychophonic Nurse. If one baby, why not all babies? If a machine could do that work, why could not machines be made to do any other kind of work?

The lighter fiction began to use the idea. A really clever article appeared in *The London Spode,* the magazine of society in England. It commented on the high cost of human companionship, and how much the average young woman demanded of her escort, not only in regard to the actual cash expenditure, but also of his time. When he should be resting and gaining strength for his labors in the office, she demanded long evenings at the theater or dance hall or petting parties in lonely automobiles. The idea was advanced that every man should have a psychophonic affinity. He could take her to the restaurant, but she would not eat, at the theater she could be checked with his opera cloak and top hat. If he wanted to dance, she would dance with him and she would stop just when he wanted her to and then in his apartment, he could pet her and she would pet him and there would be no scandal. He could buy her in a store, blonde or brunette and when he was tired of her, he could trade her in for

the latest model, with the newest additions and latest line of phonographic chatter records. Every woman could have a mechanical lover. He could do the housework in the daytime while she was at the office, and at night he could act as escort in public or pet her in private. The phonograph would declare a million times, "I love you," and a million times his arms would demonstrate the truth of the declaration. For some decades the two sexes had become more and more discontented with each other. Psychophonic lovers would solve all difficulties of modern social life.

NATURALLY, this issue of the *Spode* was refused admission to the United States on the grounds of being immoral literature. At once it was extensively "bootlegged" and was read by millions of people, who otherwise would never have heard of it. A new phrase was added to the slang. Men who formerly were called dumb-bells, were now referred to as psychophonic affinities. If a man was duller than usual, his girl friend would say, "Get a better electric attachment. Your radio tubes are wearing out and your wires are rusting. It is about time I exchanged you for a newer model."

In the meantime, life in the Teeple home was progressing as usual. Mrs. Teeple had all the time she could use for her literary work and was making a name for herself in the field of letters. She was showing her husband and friends just what a woman could do, if she had the leisure to do it. She felt that in no way was she neglecting her child. One hour every morning was spent in preparing the supplies and the modified milk for the following twenty-four hours. After that she felt perfectly safe in leaving the child with the mechanical nurse; in fact, she said that she felt more comfortable than if the baby were being cared for by an ignorant, uninterested girl.

The baby soon learned that the black woman was the one who did everything for her and all the love of the child was centered on her nurse. For some months it did not seem to realize much more than that it was being cared for in a very competent manner and was always very comfortable. Later on it found out that this care would not come unless it was in a very definite position on the bed. This was after it had started to roll around the bed. Dimly it must have found out that the nurse had certain limitations, for it began to learn to always return to its correct position in the middle of the crib. Naturally, difficulties arose while she was learning to do this. Once she was upside down and the nurse was absolutely unable to pin on the diaper, but the baby, frightened, started to cry and the machine picked it up and by a clever working of the mechanism put her down in the right position. By the time the baby was a year old a very good working partnership had been formed between the two and at times the nurse was even teaching the little child to eat with a spoon and drink out of a cup. Of course various adjustments had to be made from time to time, but this was not a matter of any great difficulty.

Tired with the work of the day, Mrs. Teeple always slept soundly. Her husband, on the other hand, often wandered around the house during the night, and on such occasions developed the habit of visiting the nursery. He would sit there silently for hours, watching the sleeping baby and the sleepless nurse.

This did not satisfy him, so his next step was to disconnect the electric current which enabled the nurse to move and care for the baby. Now, with the phonograph quiet and the nurse unable to respond to the stimuli from the baby and the phonograph, the Father took care of the child. Of course, there was not much to do, but it thrilled him to do even that little, and now, for nearly a half year, the three of them led a double life. The machine sat motionless all night till life was restored in the early morning, when Teeple connected her to an electric socket. The baby soon learned the difference between the living creature who so often cared for it at night and the Black Mammy, and while she loved the machine woman, still she had a different kind of affection for the great warm man who so tenderly and awkwardly did what was needful for her comfort during the dark hours of the night. She had special sounds that she made just for him and to her delight he answered her and somehow, the sounds he made pulled memories of similar sounds from the deep well of her inherited memory and by the time she was a year old she knew many words which she only used in the darkness—talking with the man—and she called him *Father*.

He thrilled when he held her little soft body close to his own and felt her little hand close around his thumb. He would wait till she was asleep and then would silently kiss her on the top of her head, well-covered with soft new hair, colored like the sunshine. He told her over and over, that he loved her, and gradually she learned what the words meant and "cooed" her appreciation. They developed little games to be played in the darkness, and very silently, because no matter how happy they were, they must never, never wake up Mother, for if she ever knew what was going on at night, they could never play again.

The man was happy in his new companionship with his baby.

He told himself that those hours made life worth while.

After some months of such nocturnal activity, Mrs. Teeple observed that her husband came to the breakfast table rather sleepy. As she had no actual knowledge of how he spent his nights, it was easy for her to imagine. Being an author, imagination was one of her strongest mental faculties. Being a woman, it was necessary for her to voice these suspicions.

"You seem rather sleepy in the mornings. Are you going with another woman?"

Teeple looked at her with narrowing eyelids.

"What if I am?" he demanded. "That was part of our companionate wedding contract—that we could do that sort of thing if we wanted to."

As this was the truth, Susanna Teeple knew that she had no argument, but she was not ready to stop talking.

"I should think that the mere fact that you are the

father of an innocent child should keep your morals clean. Think of her and your influence on her."

"I do think of that. In fact, only yesterday I arranged to have some phonographic records made that, in addition to everything else, would teach the baby how to talk. I have asked an old friend of mine who teaches English at Harvard to make that part of the record, so that from the first, the baby's pronunciation will be perfect. I am also considering having another Psychophonic Nurse made with man's clothes. The Black Mammy needs some repairs, and it is about time that our child had the benefit of a father's love. It needs the masculine influence. I will have it made my size and we can dress it in some of my clothes and have an artist paint a face that looks like me. In that way the child will gradually grow to know me and by the time she is three years old I will be able to play with her and she will be friendly instead of frightened. In the twilight, the neighbors will think that I am taking the child out in the baby carriage for an airing and will give me credit for being a real father."

The wife looked at him. At times she did not understand him.

IT was just a few days after this conversation that Mrs. Teeple called her husband up at the factory.

"I wish you would come home as soon as you can."

"What is the matter?"

"I think the baby has nephritis."

"What's that?"

"It's a disease I have just been reading about. I happened to go into the nursery and Black Mammy has had to change the baby twenty-seven times since this morning."

Teeple assured his wife that he would be right home and that she should leave everything just as it was. He lost no time in the journey; since he had been taking care of the baby at night, it had become very precious to him

His wife met him at the door.

"How do you know Mammy had to change her so often?"

"I counted the napkins, and the awful part was that many of them were not moist, just mussed up a little."

Teeple went to the nursery. He watched the baby for some minutes in silence. Then he took her hand, and finally he announced his decision:

"I do not think there is anything wrong with her."

"Of course you ought to know. You are such an expert on baby diseases." His wife was quite sarcastic in her tone.

"Oh! I am not a doctor, but I have a lot of common sense. To-morrow is Sunday. Instead of golfing, I will stay at home and observe her. You leave the typewriter alone for a day and stay with me, won't you?"

"I wish I could, but I am just finishing my book on 'Perfect Harmony Between Parent and Child,' and I must finish it before Monday morning, so you will have to do your observing by yourself. I think, however, that it would be best for you to send for a Doctor."

It did not take long for Teeple to find out what was wrong. The baby was learning to talk and had developed a habit of saying, very often, sounds that were very similar to *Seven.* This was the sound to which the Psychophonic Nurse had been attuned to react by movements resulting in a change of napkins. The baby had learned the sound from the phonograph and was imitating it so perfectly that the machine reacted to it, being unable to tell that it was not the voice from the phonograph, or the electrical stimulus from the wet pad. When Teeple found out what was the trouble, he had to laugh in spite of his serious thoughts. A very simple change in the mechanism blotted out the sound *Seven,* and cured the baby's nephritis.

TWO weeks later, the inventor introduced his wife to the new male nurse who was to be a Father substitute. The machinery had been put into a form about the size of Teeple, the face was rather like his and he wore a blue serge suit that had become second best the previous year.

"This is a very simple machine," Teeple told his wife. "For the present it will be used only to take the baby out in our new baby-carriage. The carriage holds storage batteries and a small phonograph. We will put the baby in the carriage and attach Jim Henry to the handles, pointing him down the country lane, which fortunately is smooth, straight as an arrow and but little used. We attach the storage batteries to him and to the phonograph, which at once gives the command, "Start." Then, after a half hour, it will give the command, "About Face—Start," and in exactly another half hour, when it is exactly in front of the house, it will give the command "Halt." Then you or the servant will have to come out and put everything away and place the baby back in the crib under the care of the mechanical nurse This will give the baby an hour's exercise and fresh air. Of course she can be given an extra hour if you think it best. If you have an early supper and start the baby and Jim Henry out just as the sun is setting, the neighbors will think that it is really a live Father who is pushing the carriage. Rather clever, don't you think?"

"I think it is a good idea for the baby to go outdoors every day. The rest of it, having it look like you, seems rather idiotic. Are you sure the road is safe?"

"Certainly. You know that it is hardly used except by pedestrians and everyone will be careful when they meet a little baby in a carriage. There are no deep gutters, the road is level, there are no houses and no dogs. Jim Henry will take it for an hour's airing and bring it back safely. You do not suppose that I would deliberately advise anything that would harm the child, do you?"

"Oh! I suppose not, but you are so queer at times."

"I may seem queer, but I assure you that I have a good reason for everything I do."

Anyone watching him closely that summer would have seen that this last statement was true. He insisted on an early supper, five at the latest, and then he always left the house, giving one excuse or another, usually an important engagement at the factory. He

made his wife promise that at once after supper she would start Jim Henry out with the baby in the carriage. Mrs. Teeple was glad enough to do this, as it gave her an hour's uninterrupted leisure to work in her study. The mechanical man would start briskly down the road and in a few minutes disappear into a clump of willows. Here Teeple sat waiting. He also was dressed in a blue serge suit. He would make the mechanical man lifeless by disconnecting him from the storage batteries, place him carefully amid the willows and, taking his place, would happily push the carriage down the road. He would leave the phonograph attached to the battery. When it called "About Face," he would turn the carriage around and start for home. When he reached the willows, he would attach the mechanical nurse to the carriage and let it take the baby home. Sometimes when it was hot, the baby, the Father and Jim Henry would rest on a blanket, in the shade of the willows. Teeple would read poetry to his child and teach her new words, while Jim Henry would lie quietly near them, a look of happy innocence on his unchanging face.

The few neighbors who were in the habit of using that road after supper became accustomed to seeing the little man in the blue serge suit taking care of the baby. They complimented him in conversations with their wives and the ladies lost no time in relaying the compliment to Mrs. Teeple, who smiled in a very knowing way and said in reply:

"It certainly is wonderful to have a mechanical husband. Have you read my new book on "Happiness in the Home"? It is arousing a great deal of interest in the larger cities."

She told her husband what they said and he also smiled. Almost all of the men he had met during the evening hour were Masons and he knew they could be trusted.

When the baby was a year old, Mrs. Teeple decided that it was time to make a serious effort to teach the child to talk. She told her husband that she wanted to do this herself and was willing to take fifteen minutes a day from her literary work for this duty. She asked her husband if he had any suggestions to make. If not, she was willing and able to assume the entire responsibility. He replied that he had been reading up on this subject and would write her out a list of twenty words which were very easy for a baby to learn. He did this, and that night she met him with a very grandiose air and stated that she had taught the baby to say all twenty of the words perfectly in one lesson. She believed that she would write an article on the subject. It was very interesting to see how eager the child was to learn. Teeple simply grinned. The list he had given her was composed of words that he and the baby had been working with for some months, not only at night, but also during the evening hour under the willows.

By that fall, Mrs. Teeple was convinced that Watson, in his book called "Psychological Care of Infant and Child," was absolutely right when he wrote that every child would be better, if it were raised without the harmful influence of mother love. She wrote him a long personal letter about her experience with the Psychophonic Nurse. He wrote back, saying that he was delighted, and asked her to write a chapter for the second edition of his book. "I have always known," he wrote at the end of the letter, "that a mechanical nurse was better than an untrained mother. Your experience proves this to be the truth. I wish that you could persuade your husband to put the machine on the market and make it available to millions of mothers who want to do the right thing, but have not the necessary intelligence. Every child is better without a love life. Your child will grow into an adult free from complexes."

Mr. Teeple smiled some more when he read that letter.

IT was a pleasant day in early November. If anything, the day was too warm. There was no wind and the sky over western Kansas was dull and coppery. Teeple asked for a supper earlier than usual and at once left the house, telling his wife that the Masons were having a very special meeting and that he had promised to attend. Thoroughly accustomed to having him away from home in the evening, Mrs. Teeple prepared Jim Henry and started him down the road, pushing the little carriage with the happy baby safely strapped in it. Then she went back to her work.

Jim Henry had left the house at five-fifteen. At five-forty-five he would turn around, and at six-fifteen he would be back with the baby. It was a definite programme and she had learned, by experience, that it worked safely one hundred per cent of the time. At five-thirty a cold wind began to whine around the house and she went and closed all the windows. It grew dark and then, without warning, it started to snow. By five-forty-five the house was engulfed in the blizzard that was sweeping down from Alaska. The wind tore the electric light poles down and the house was left in darkness.

And Susanna Teeple thought of her child in a baby carriage out in the storm in the care of an electrical nurse. Her first thought was to telephone to her husband at the Lodge, but she at once found out that the telephone wires had been broken at the same time that the light wires had snapped. She found the servant girl crying and frightened in the kitchen and realized that she could expect no help from her.

Wrapping a shawl around her, she opened the front door and started down the road to find her baby. Five minutes later she was back in the house, breathless and hysterical with fright. It took her another five minutes to close and fasten the door. The whole house was being swayed by the force of the wind. Outside she heard trees snapping and cracking. A crash on top of the house told of the fall of a chimney. She tried to light a lamp, but even in the house the flame could not live. Going to her bedroom, she found an electric torch and, turning it on, she put it in the window and started to pray. She had not prayed for years; since her early adolescence she had prided herself on the fact that she had learned to live without a Creator whose very existence she doubted. Now she

was on her knees. Sobbing, she sank to the floor and, stuporous with grief, fell asleep.

AS was his nightly custom, Teeple waited in the willows for Jim Henry and the baby carriage. He disconnected the mechanical man and put him under a blanket by the roadside; then he started down the road, singing foolish songs to the baby as they went together into the sunset. He had not gone far when the rising wind warned him of the approaching storm and he at once turned the carriage and started towards home. In five minutes he had all he could do to push the carriage in the teeth of the wind. Then came the snow, and he knew that only by the exercise of all of his adult intelligence could he save the life of his child. There was no shelter except the clump of willows. Every effort had to be made to reach those bushy trees, Jim Henry and the blanket that covered him. One thousand feet lay between the willows and the Teeple home and the man knew that if the storm continued, they could easily die, trying to cover that last thousand feet. It was growing dark so fast that it was a serious question if he could find the clump of willows. He realized that if he once left the road, they were doomed.

He stopped for a few seconds, braced himself against the wind, took off his coat and wrapped it around the crying child. Then he went on, fast as he could, breathing when he could and praying continuously. God answered him by sending occasional short lulls in the tornado. He finally reached the willows, and instinct helped him find Jim Henry, still covered by the blanket, which was now held to the ground by a foot of snow.

The man wrapped the baby up as well as he could, put the pillow down next to Jim Henry, now partly uncovered, put the baby on the pillow, crawled next to her, pulled the blanket over all three as best he could, and started to sing. The carriage, no longer held, was blown far over the prairie. In a half hour, Teeple felt the weight and the warmth of the blanket of snow. He believed that the baby was asleep. Unable to do anything more, he also fell asleep. In spite of everything, he was happy and told himself that it was a wonderful thing to be a Father.

During the night the storm passed and the morning came clear, with sunshine on the snow drifts. Mrs. Teeple awoke, built a fire, helped the servant prepare breakfast and then went for help. The walking was hard, but she finally reached the next house. The woman was alone, her husband having gone to the Masonic Lodge the night before. The two of them went on to the next house, and to the next and finally in the distance they found the entire Blue Lodge breaking their way through the snow drifts. They had been forced to spend the entire night there, but had had a pleasant time in spite of their anxiety. To Mrs. Teeple's surprise, her husband was not with them. She told her story and appealed for help. The Master of the Lodge listened in sympathetic silence.

"Mr. Teeple was not at the Lodge last night," he finally said. "I believe he was with your baby."

"That is impossible," exclaimed the hysterical woman. "The baby was out with the new model Psychophonic Nurse. Mr. Teeple never goes out with the baby. In fact, he knows nothing about the baby. He never notices her in any way."

THE Master looked at his Senior Warden, and they exchanged "unspoken words." Then he looked at the members of his Lodge. They were all anxious to return to their families, but there were several there who were not married. He called these by name, asked them to go to his home with him and get some coffee, and then join him in the hunt for the baby. Meantime he urged Mrs. Teeple to go home and get the house warm and the breakfast ready. She could do no good by staying out in the cold.

The Master of the Blue Lodge knew Teeple. He had often seen him under the willows talking to the baby. Instinctively he went there first, followed by the young men. Breaking their way through the drifts, they finally arrived at the clump of trees and there found what they were looking for—a peculiar hillock of snow, which, when it was broken into, revealed a blanket, and under the blanket were a crying baby, a sick man and a mechanical nurse The baby, on the pillow, wrapped up in her Father's coat, and protected on one side by his body and on the other side by the padded and clothed Jim Henry, had kept fairly warm. Teeple, on the outside, without a coat and barely covered by the edge of the blanket, had become thoroughly chilled.

It was days before he recovered from his pneumonia and weeks before he had much idea of what had happened or of his muttering conversations while sick. For once in his life, he thoroughly spoke of everything he had been thinking of during the past fifteen months —spoke without reservation or regard for the feelings of his wife—and above all else he told of his great love for his child and how he had cared for it during the dark hours of the night and the twilight hour after supper.

Susanna Teeple heard him. Silent by his bedside, she heard him bare his soul and she realized, even though the thought tortured her, that her ambition had been the means of estranging her husband and her child from her, and that to both of them she was practically a stranger. During the first days of her husband's illness she had placed the entire care of the child in the hands of the Black Mammy. Later it was necessary to get nurses to care for her husband, and as he grew stronger, there was less and less work for the wife. Restless, she went to the kitchen, but there a competent servant was doing the work: in the sick-room, graduate nurses cared for her husband; in the nursery, her baby was being nursed by a machine, and her little one would cry when she came near as though protesting against the presence of a stranger. The only place where she had work to do and was needed was in her study, and there the orders for magazine articles were accumulating.

She tried her soul. As judge, witness and prisoner, she tried her soul and she knew that she had failed.

(Continued on page 737)

The MOON MEN

By Frank Brueckel, Jr.

Foreword

BACHUS was introduced to me at the home of a friend of mine, where both of us were spending our vacations. He impressed me as being a strange personality from the first, and, curiosity being one of my chief characteristics, I determined to find out what I could of him. I discovered that he had traveled quite a little, and, as travel has a particular fascination for me, I pumped him on his experiences in different parts of the world.

I demanded to know what he had done the summer before, whereupon he answered that he had been away. Upon my inquiring where, he looked at me with a long, steady stare, then asked me to come to his room. There he showed me a manuscript, stating that it contained the facts of his last year's experiences. He gave me permission to read it, and I did so in my room that night. I didn't believe it, but I complimented Mr. Bachus on his brass nerve in trying to tell such stuff to a rational-minded person.

Here is what I read:

Chapter I.

Into Infinity

MY name is Clyde Bachus. I am thirty-four years old and was born in Montana. My father was an amateur astronomer, and the wealth he inherited enabled him to construct a fairly well equipped observatory, which he devoted entirely to the study of the Moon and the planets Venus, Mars and Jupiter.

With his constant companion and friend, Lloyd, at his side, he tried to solve the Mars riddle, attempting dozens of magnifying lenses in dozens of ways to bring the ruddy planet to a range where intelligent handiwork could be indisputably made out, but he never succeeded.

So Lloyd determined to undertake what had baffled so many before him—the construction of a space-flyer. For five years he studied and experimented, working day and night on his project.

"We do not know just what gravity is," he said to me one day, "but I personally believe it to be some sort of wave-motion emanating from every concentration of matter. I believe that it is produced by the motion of electrons revolving about the nucleus of every atom of matter. You know, of course, that if you take a board and move it swiftly in a circular motion in a pool of water, any small objects floating on the pool's surface will be rapidly drawn round and round, and finally be pulled to the middle of the little whirlpool, where it will be sucked down into the water. In the same way, I believe the revolution of the electrons create a sort of suction in the ether, drawing everything toward them. The greater the number of atoms, and consequently the greater the material object, the greater the force of this suction. If my theory is correct, if gravity *is* a wave with definite sources of emanation, then I believe we will have a space-projectile in a short time. I have an idea—" and his voice trailed off into silence. Then he turned and went to his laboratory.

HERE is a charming interplanetarian story, which you won't lay down until you have finished with it; a story of adventure and good science, yet plausible throughout. It keeps you on the jump from the beginning to end and you will be, as we were, sorry that the story was not twice as long. Incidently, the story contains excellent science in such a manner, that it is always highly interesting—it never drags, even for a moment.

ONE day he came dashing up the steps of the veranda, waving a square, opaque plate about his head.

"I've got it!" he shrieked, "I've got it!"

My father and I rose from our chairs.

"Got what?" I demanded.

Still waving the metal plate about, Lloyd explained that at last he had succeeded in combining several metallic elements which, when a powerful current of electricity passed through it, had the power not merely of nullifying gravity, but of *reflecting* this wave-motion back upon its source of emanation, thereby transforming it into a *repulsive* force.

After that, things went swiftly. In a short time a small experimental rocket, its cabin filled with a powerful explosive, was sent to the Moon, and as the rocket landed on the unilluminated part of the moon (it was in its first quarter) the powder exploded at the concussion, the flash being seen by Lloyd and father at their telescopes. It had taken the rocket thirty minutes to reach its goal, but Lloyd claimed that his space-ship could go faster.

Immediately following this successful demonstration, plans were made for a private party to explore the regions of cosmic space—first the Moon, then Venus or Mars. But my father was never to see his hopes fulfilled, for the excitement was too much for him, and he died, at the age of sixty-nine.

That was two years ago.

HENRY LLOYD and I stepped into the *Space-Waif*.

The *Space-Waif* is a good-sized interplanetary flyer, fifty feet long and twelve feet in diameter for about forty feet of its length, then it curves inward to a hemisphere or dome at its forward end. Between the inner and outer shell is a vacuum space to keep the inside temperature normal and to keep out the intense cold of interplanetary space. The projectile is divided

Before us were seven new monstrosities—seven feet tall from their small, aristocratic, high-arched feet to the tops of their great globular heads—and each one clutched a glass rod about two feet long.

into several compartments—the observatory, at the forward end, containing telescope and spectroscope; the plotting and instrument room, immediately below the dome; the living room; and finally the store and engine room. Each room has two circular windows, opposite each other, and the dome has a glass-covered slit besides, which is rotatable.

"We're all set, my boy," said Lloyd, after he had shown me the provision-spaces all well filled, the berths ready, the observatory, plotting room and cabin, fully furnished; the armament closets, containing guns, swords, knives, and ammunition; and the book-shelves holding every story of interplanetary traveling that he could get, besides a number of scientific romances.

"When do we go—what time?" I asked.

"To-morrow night, at eight o'clock."

The next day passed slowly for me; why, I cannot say, but Lloyd had to arrange a whole lot of business, including his will.

Besides Lloyd and myself, there were three other members—two of them, Rosonoff, the Russian, and Lenhardt, a German, were intimate friends of my father; while the third, Benson, was an American mechanic, who had constructed most of the machine, though we doubted if he knew what it was for. We decided to take him along in case of engine trouble.

At last the sun set; we hurriedly ate our meal, the last on our Earth for some time to come—perhaps forever—in tense silence. When we finished, we went straight to the shed which housed the *Space-Waif*.

Rosonoff wanted to set sail at once, but Lloyd was determined to start at exactly eight o'clock. During the time that remained, he went over the flyer once more, minutely examining every corner, while Benson accompanied him. Rosonoff, Lenhardt, and I stood about, staring with unseeing eyes out of the windows, or casting nervous glances at the clock on the plotting-room wall. That clock's slow, deliberate, unemotional ticking aroused a senseless hatred against it within me—a hatred that was to become more intense later on.

Presently the hands crept to ten minutes to eight. Lloyd called us out of the flyer and we opened the great doors in the roof, through which the machine must pass. This only took a few minutes, after which we descended to the ground and re-entered the space-ship.

"Does anyone wish to stay behind? If so, speak now, for I shall start the motors before eight," said Lloyd.

No one moved or spoke. The door clicked.

For a moment we all stood in silence, each man sending up a fervent prayer to the Infinite Wisdom, and then we looked up, glanced nervously about and instinctively grasped something to hold on to, as we saw Lloyd look at the clock and move a lever.

A low hum broke the intense stillness in the room of the space-car, and then we heard the low rumble of an engine. Presently the entire motor was in action. Lloyd shifted several other levers, and then set his hand on the one that controlled the intensity of the electric current passing through the gravity screens. Slowly he pulled it down, and, just as the clock hands pointed to the hour of eight, there came a slight scraping sensation and we slowly rose into the air. Steadily Henry Lloyd drew back the lever that controlled the speed of the space-ship, and constantly the speedometer mounted. At last, at 8:10 P. M., Lloyd, glancing at the distance-meter, which registered ten miles, drew back the speed lever more swiftly, till at 8:15, with the distance dial reading 400 miles, the *Space-Waif's* full speed was developed.

I looked at the speedometer and was amazed. The instrument recorded a speed of 1,000 *miles a second!*

We all stared out of the window at the marvelous sight before us. The entire scope of our vision was covered with round, blazing, blinding orbs of light. The rays which we see on Earth were gone, the stars looked smaller and perfectly round, but the intensity of their light was blinding. Nor were there the comparatively few we see under our planet's atmosphere. Thousands of suns covered the black vault. So thick were they, that it seemed as if there were hardly any space left between them. A moment that blinding light struck us, then Lloyd pulled down the thin, leaden rolling shade over the window.

"It didn't occur to me before," said Lenhardt, blinking, "but don't you think we might suffer from the effects of the Cosmic Ray, discovered a while ago by Dr. Millikan, and which is supposed to emanate from the stars?"

"Fortunately," replied Henry Lloyd, "I thought of that and prepared for it. The windows are made of certain crystals, which have been fused under terrific heat and combined with several oxides, and the whole allowed to cool, still keeping a transparent condition. This combination is as effective against the Millikan Ray as my gravity mirrors are against gravitational attraction."

A SUDDEN click and an equally sudden swerving of the car caused us to look painfully about. Lloyd looked at his space-compass, one of his latest inventions, the needle of which, if pointed at any certain object and adjusted to its distance, would always point to that object, regardless of how its position or distance might change.

He leaped to the steering wheel, jerked it halfway round to his right, and then there was another *click!* and the wheel refused to budge further. Rosonoff, Lenhardt, and I attempted to bring the great gravity screens back to a point that would steer the *Space-Waif* toward the Moon, but in vain. Then the mechanic, Benson, tried to help us right the wheel by physical force, but we might as well have tried to push over the Woolworth Building.

"Benson, you'll have to fix whatever's wrong with this thing," spoke Lloyd, as he looked at his instruments and star-maps. "We must be heading for Jupiter," he continued a moment later.

Benson entered the engine room and for an hour or more did not emerge. When he did, despair was written on his face.

"The whole shootin'-match is outa order," he said simply. "I can't fix nottin' as long as she's movin'."

Lloyd slowly pushed up the speed lever, but the speedometer still recorded our tremendous pace. Pale and nervous, he pushed up the starting lever, which should have shut off the electric current passing through the gravity reflectors, but still we heard the uninterrupted hum of the heavy cables beneath our feet.

In a last desperate effort, he jammed down the lever that controlled the forward gravity screens, hoping that their action would check our pace. But no second, shriller hum came to tell us that the current was passing through them.

Weakly, Lloyd sank into a chair. He looked up at me.

"I told you to make your will, but you wouldn't listen. Why didn't you?" he demanded. "You might have known this would happen!"

"You might have known it, too, and told me to stay behind," I retorted.

My answer seemed to remind him that the lives of our fellow travelers also were in danger, for he said, "Gentlemen, I am extremely sorry that I induced you to accompany me on this journey when I might have guessed that the *Space-Waif* would prove incapable of accomplishing the great feats that I foolishly assumed she could easily do."

"You do not suppose that it is the engine's fault, do you?" said Rosonoff. "Mark my word, Mr. Lloyd, there's a traitor on board."

Everyone started as though a whip had lashed him.

"A traitor!" cried Lloyd. "But who would want to wreck the *Space-Waif* or wish us harm?"

"I'll take back what I said about the traitor being on board. But someone tampered with the engines, perhaps so cleverly that you did not notice it when you inspected the motor before we left the Earth."

"I am confident that every man on board is innocent. Each one has always shown himself honest and trustworthy."

Silence fell. Rosonoff glanced at the clock and pulled from his pocket a pencil and some paper. He scribbled something.

"It's an hour and a half since we have been traveling at full speed," he said, "and during that time we have gone 5,400,000 miles!"

"Whew! Don't stagger me with such numbers—I'm sick enough already. I'm going to bed," said Lenhardt.

That brought us to decide on the same thing—there was nothing to be gained sitting around getting headaches, and so five weary human atoms in the great universe crept to rest, while their car carried them ever farther into infinity—perhaps into eternity.

Chapter II

In Another World

MY slumbers, after a long period of wakefulness, were broken, and filled with disquieting dreams—the *Space-Waif,* the Moon, Lloyd, my will, death! All these haunted my irregular sleep.

Finally I snapped on my light and looked at my watch. It was 8:15 A. M.—twelve hours since our terrible pace had been reached. During my slow dressing I procured a piece of paper and a pencil and computed that during that time we had sped 43,200,000 miles into space.

While I washed, Lloyd and Rosonoff joined me. I told Lloyd of the distance we had gone during the night—I say "night," because I find it more convenient, but within the space-ship there was no day or night—there was only darkness without, and we constantly had the lights on within. The only way we could time our actions was with our watches. He nodded.

"We are in the orbit of the planet Mars—you know that its elliptical path carries it from 35,000,000 to 60,000,000 miles from our Earth. The planet itself is now on the other side of the sun."

Back in the living room, we found Benson serving our breakfast, which he had prepared over the electric heater. But we ate little. The prospect of dying in the space-flyer, millions of miles from our own Earth, was not calculated to rouse a ravenous appetite.

The entire day was spent by Lloyd looking at his space-maps, instruments, and control levers, while Benson was constantly in the engine room. But no change was effected—steadily we sped on—on—on. At 8:15 P. M., twenty-four hours after our departure, we had traveled 86,400,000 miles into space.

Thus three weary, leaden-footed days crept slowly by. Constantly our distance from the Earth increased—172,800,000 miles—259,200,000 miles—345,600,000 miles; no reassuring word from the mechanic; and Lloyd could only state that we were speeding to certain death on the molten—or frozen—surface of giant Jupiter.

Suddenly Lloyd passed to the instrument wall and I saw him working with the valves that controlled the air supply within the car. At the same time I became aware that my lungs were aching dully, and that my companions were breathing irregularly—gaspingly.

"If we use our air supply sparingly, we have enough air left to keep us alive for about fifteen more hours—then—well—" he said. He mused a while at his instruments.

"We're approaching Jupiter—well, we're only 55,500,000 miles from his surface. Wonder how we'll find it—molten or frozen?"

On and on at our reckless pace plunged the *Space-Waif;* hour after hour dragged by—slowly—slowly—every second an eternity—with the men trying hard, striving tremendously to retain their holds upon their minds.

"Good Lord!" cried Lenhardt. "If I have nothing to do, I shall go crazy!"

"I agree with you—the suspense is maddening!" exclaimed Rosonoff in a whisper. I glanced at Lloyd. His face was rather pale, and his chest rose and fell heavily; dark pouches were under his eyes.

AS I sit here and write, I cannot but realize how pitifully inadequate is my vocabulary, and diction, in making an attempt to portray our situation on this damnably unemotional paper. No matter how vivid

your imagination, my dear reader, you can never truly visualize that scene in the space-car—swaying and rocking as it fell out of its path when it approached meteors and asteroids, which shifted it, for Lloyd had devised a machine which spread radioactive rays about the space-ship, and which sent it from an approaching object and brought it back to its original course, after the obstruction had been passed—we passengers sitting on our chairs—the monotonous, maddening hum of the electric cables beneath our feet—Benson tampering in the engine room—Lloyd staring at his charts like a man in a trance—and that infernal clock on the wall mercilessly ticking out our doom.

Thus ten hours dragged by—eleven—twelve—thirteen—fourteen—. Breathing was becoming difficult again. Lloyd still stared and calculated at his desk; Benson was in the engine room, Rosonoff and Lenhardt were playing chess to keep their minds from slipping, while I watched them. But their thoughts were not on the game. I did not notice it then, but now, as I recall the scene, I saw them make only blunders—a dozen times each one placed his pieces so that his king could easily have been checkmated, and each time his opponent overlooked it and made foolish, indecisive moves.

A half hour went by—Rosonoff and Lenhardt were lying unconscious over their table, the chessmen sprawled over the board, the game unfinished. Benson came in from the engine room.

"I've got that there speed thing fixed up, an' the front screens, but I still can't turn her," he announced. He cast himself on the lounge and fell into a deep sleep, from which he would probably never awake.

Lloyd rose and passed unsteadily into the observatory. "One look at Jupiter at close range before I die," he said, as I joined him.

He put up the lead shade from the circular window at the apex of the dome, and together we looked out upon the most marvelous scene I had ever witnessed up to that time. The whole window was covered by a titanic disk, with alternate light and dark stripes, running vertically.

"Say," I said, turning to Lloyd, "I thought Jupiter's stripes ran horizontally. These are vertical."

"That is merely our position relative to Jupiter. You are lying on your side, relative to Jupiter or the Earth. You are standing erect here within the *Space-Waif* only because you are almost entirely cut off from the gravitational force of every other body in space, and because the car's center of gravity is beneath our feet. You know that there is a bed of heavy metals beneath us, in order to maintain some degree of equilibrium. In a little while you will seem to be dropping down on Jupiter, while now you seem to be approaching him horizontally. Do you understand what I mean?"

"I believe so," I replied, and again looked out of the window. Jupiter certainly presents an impressive spectacle at one and a half million miles.

I presently became aware that the car was slowly rotating, and when we had reached a distance of about one million miles from Jupiter's surface, the bands were horizontal, and I now had the impression of falling *down* on the planet.

Directly in our path was a blotch of color—green and blue and white—which I had at first taken for some part of the planet's surface, but I now perceived it to have a clear-cut circular appearance.

I turned toward Lloyd, a question on my lips, and was horrified to find him lying at my feet, eyes closed. For a moment I thought he was dead, but then I saw his chest rise and fall—he had only swooned. I dashed into the living room and returned with the last glass of water in the flyer.

I forced it between his lips and a moment later he opened his eyes.

Suddenly he stared out of the window, and following his gaze, I, too, looked out. A simultaneous cry of amazement broke from our lips. Before us, covering the whole window, stretched an enormous landscape—towering mountains, green verdure, white snow, blue lakes, ochre deserts!

Lloyd scrambled to his feet and staggered into the plotting-room. There he pushed up the speed lever and we lunged against the wall as the car's progress slackened. A moment later he shut off the current passing through the rear gravity screens and started the less powerful one that passed through the smaller forward screens. The shock-absorber showed its work after a second; the car's speed diminished, and finally there came a slight jar, and the electric current stopped.

Lloyd looked at me and I at him.

"Where are we? On Jupiter?" I asked.

"I don't know, my boy," he replied. "But we had better see if this land has pure atmosphere. Here, shut off these valves"—he twisted the wheels on the oxygen tanks—"Now open this valve."

He indicated one which opened an intake pipe to test the atmosphere of a planet, and as I opened it, he leaned forward, his nostrils to the pipe. I, too, leaned down, and to my lungs came a breath of cold fresh air.

Then our senses left us, and we sank unconscious to the floor.

WE must have slept many hours—I do not know exactly how long, before I awoke. Then I saw Lloyd move his arm, and Benson rising to his feet from the lounge. Lloyd opened his eyes and looked into mine. Then we slowly rose to our feet.

The pure air coming in through the intake pipe rapidly revived Lenhardt and Rosonoff. When all were fully awake, Lloyd told them of the landscape we had last seen, and of our atmosphere test.

This roused us all thoroughly, and together we crowded forward to the door of the *Space-Waif*, eager to see the world upon which Fate had thrown us.

Lloyd hesitated a moment, then flung open the door. Eagerly we gazed out—upon a great expanse of blue water, reaching to a horizon which was remarkably close. Between the car and the sea a level slope a hundred yards wide led to the shore.

We tumbled out into this home-like landscape, and there, as we stopped to look about, another surprise awaited us. For to our right, a tremendous disk,

striped with broad, red bands and whitish-yellow ones, spread over an enormous part of the heavens—fully one-fourth of that quarter of the sky, while on our left shone a beautiful star—the sun—with an apparent diameter of about one-fifth that of the Earth. The sky on the side of the star was of the fairest blue, merging near the gigantic disk until it became a deep blue-black.

Behind us, where our attention was next drawn, rose a forest of titanic green fern-like trees—such flora as must have existed on our own planet during the carboniferous period. A hundred feet and more those huge fronds rose into the air, gracefully swaying in the breeze—giving to the whole scene the aspect of a weird dream.

"Where are we?" I asked Lloyd.

He was gazing about him with the light of growing conviction in his eyes.

"We are on Ganymede—the largest of Jupiter's nine known moons," he replied, and both Lenhardt and Rosonoff nodded their agreement.

Ganymede is the third of Jupiter's satellites, is 3,550 miles in diameter, and revolves about its primary in 7 days, 3 hours, and 42 minutes, at a distance of 664,000 miles.

For several seconds we gazed silently about us, then came an exclamation of surprise from Lenhardt. Following his pointing finger with our eyes, we were amazed to see, barely a hundred feet away, among the tall, thick reeds along the shore, a titanic, grotesque creature—a veritable dragon, it seemed, from some ancient folk-tale.

The monster measured at least eighty feet in length, and the highest part of its back was some twenty-five feet from the ground. Its color was slate-blue, and its whole skin was a mass of great armor scales. A row of sharp horns ran along its spine, to taper down gradually along the massive tail. The head was about two feet long and one foot wide, and the most hideous I had ever seen. Besides a powerful beak, the head was armed with six long horns, three on each side, and two long, sharp saber-teeth protruded from the upper jaw. One of these, I noticed, had been broken, no doubt in some fierce battle.

That fiendish beast regarded us a minute, then it advanced, its giant feet striking the earth with dull and even thuds.

"Quick, into the *Space-Waif!* That thing will kill us!" cried Lloyd.

We needed no second invitation. Barely had Lloyd spoken the first word than we had plunged headlong into the space-flyer and quickly slammed the door behind us.

"What is it?" demanded Rosonoff.

"Some sort of carnivorous dinosaur not native to our own planet. That is all I can say just now," said Lenhardt.

"Anyway," said Lloyd, "it looks as if we'll have much more adventure on this moon of Jupiter, than we would have had on our own cold, lifeless satellite."

"I quite agree with you," I assented, as we waited to see what that thing outside would do next.

Chapter III.

Captives

THROUGH our quartz windows we watched the beast, which Rosonoff had termed *Ceratuarus-Ganymedeus-Lenhardtus* until a fitter name could be decided upon, as it lumbered toward the *Space-Waif*. Its movements were slow, but the length of its strides enabled it to make remarkable progress.

It advanced to within a few yards of the *Space-Waif,* and regarded the machine with a decidedly belligerent attitude, lashing its great tail and waving its hideous head about as though challenging the flyer to combat. Finding, however, that the *Space-Waif* did not reciprocate its warlike intentions, the *Cerataurus-Ganymedus* probably decided the shining car to be some sort of rock, and presently waddled down to the water, which it entered, and moved to a patch of green weeds rising from the surface of the sea, a few yards from the shore.

"Omnivorous, hm-m. I supposed it was purely carnivorous in its diet," commented Lenhardt, as the reptile tore out a mouthful of the water weeds.

Presently Lloyd, who had busied himself at his instruments when the creature left the flyer, spoke up.

"The trip from the Earth was made in just 4 days, 15 hours, 10 minutes, and 4 seconds, Earth time. I have a stop watch here which was put to work when the machinery began to move, and stopped when we landed here on Ganymede. These tapes here register the time it ran."

"Say, Henry," said I, "you never really told me what took place when those gravity screens work. All you told me was your theory of gravitational attraction."

"Well, you see, it is a change in the atomic structure and electronic revolution of the gravity screens, plus certain electrical vibrations, which cause the gravity wave to be reflected back upon its source of emanation."

"Please explain one more thing, Mr. Lloyd," said the Russian. "How is it that we maintained an even pace throughout the journey? If matter attracts matter directly proportional to the mass, and inversely as the square of the distance, then our speed should have increased the farther we were from the Earth."

"Oh, yes," said Lloyd, "but you see, I have an instrument which practically locks the pace at any point. It really decreases the action of the gravity screens in proportion to the force of the gravity wave exerted upon us. Do I make myself clear?"

Rosonoff stated he was satisfied, and looked out of the window.

"I cannot see our Ganymedean acquaintance any more, so suppose we eat and then explore in search of good water."

"Good idea, we may as well," agreed Lloyd and Lenhardt.

Cautiously Rosonoff, Lloyd and I once more crept out of the *Space-Waif,* this time each man armed with a rifle, a revolver, a hunting knife, and a belt of cartridges.

Once outside, we stood in a little knot, casting wary glances in every direction to see if the *Ceratourus-Ganymedeus* or any other form of animal life were in the immediate vicinity. But nothing moved, and so we decided to follow the direction of the needle of a compass Lloyd had taken with him.

Taking out a note-book, Lloyd made a few notations in it and then said, "Gentlemen, in accordance with the agreement we made on Earth, I am going to lead this exploring party, and I look to fidelity from each one of you until it is proved that I am incapable of assuming command. In such a case, the leadership will be given to a person who is able to conduct the expedition. Now —I will take the lead, Mr. Rosonoff will be second, and you, Clyde, will bring up the rear."

He shouldered his rifle and stepped out toward the forest.

Up till now we had done no real walking; we had either taken a few faltering steps or some wild leaps, as when we dived into the space-flyer to escape the dinosaur. I had experienced the sensation of being peculiarly light, but my interest in the appearance of Ganymede had not permitted me to give the matter much thought. But now, as Henry Lloyd took a resolute step forward, Rosonoff and I were surprised to see him rise about two feet in the air, and sprawl upon the ground a yard further on.

Exclamations of astonishment broke from us. Lloyd sat up, a puzzled look on his face; but in a moment it vanished and a rather sheepish grin took its place.

"How silly of me not to have thought of that before! Gentlemen, I advise you to shuffle your feet along as you walk, else the lesser gravitation of this planet, compared to the Earth's, will play—ah—rather queer antics with us," he said as he rose to his feet.

We followed his advice as we began marching again, and the result was most gratifying. It was just as though we were walking under normal conditions on our own beloved Earth.

THE incident brought another thing to my mind. "Henry," said I, "how is it that we feel the effects of gravitation only when we are on a planet? Why didn't we notice any difference in the space-flyer? What I mean is—ah—how is it . . . when we were in the *Space-Waif*, the gravitational conditions were the same as on Earth, but the car certainly couldn't exert *that* much gravity on us, could it?"

"I thought of that, too," he replied, "but I can't give you a definite answer. I *think* it was our great speed, coupled with some queer freak of relativity, that permitted us to move about as naturally as on Earth."

Rosonoff broke in.

"I disagree with you on one point. There are no freaks in the laws of nature. If a smaller body in space exerts a greater gravitational force on an object than a larger one does, it is because the smaller body is composed chiefly of elements with a greater number of electrons revolving about the nucleuses of their atoms, which implies that the atoms are heavier, and which consequently have a greater attractive force upon the given object than the larger body, which is not constituted of such heavy elements. Isn't that right?"

"I didn't mean it just that way," returned Lloyd. "I meant that perhaps through some unknown expedient, our muscular force was decreased, while we were traveling in the car, practically shut off from the gravitational attraction of every other body in space.

"The fact that we five men could not right the steering wheel tends to corroborate my idea. We should have been able to push the car way out of its path, when we consider that it weighed almost nothing."

A few more moments we trudged in silence, then we came to a spring of clear, cold water. I threw myself down before it and wanted to take a deep drink, but Lloyd grasped my shoulder.

"Better not, my boy," he said. "It might be poison. We will take a sample back to the car and test it." He took down his empty canteen and dipped it into the spring. Then we returned to the *Space-Waif*, where he immediately busied himself in the work of testing the water, while I sat at a window, looking out at the blue sea, and the great Jovian disk. Its three broad red stripes had, even in the brief hour or so since we had first seen it, changed into five narrower, coppery bands, though the whitish yellow belts still retained most of their form and color.

Presently Lloyd came out.

"The fluid is pure water, gentlemen—of precisely the same chemical constitution as the water on Earth. I believe we will find the fauna and flora of this land very much the same as that on Earth, for the simple reason that its atmospheric and geological conditions are nearly the same as on our own planet.

"It is our duty to science and to our world to explore as much as possible of this moon," he went on, "and so I suggest that we explore the neighboring country by sending out two men at a time to refill our larder, while three of us remain with the *Space-Waif* and repair it. Clyde, you and Mr. Rosonoff will go first. While you are gone, Mr. Lenhardt will prepare to renew the air supply within our car, and Benson and I will repair the engines of the *Space-Waif*, if it is possible for us to do so."

Rosonoff slung a heavy rifle over his shoulder, buckled a cartridge belt with holster and six-shooter about him, took the compass Lloyd had used, and stepped out of the *Space-Waif*. Armed with rifle and revolver, I followed him.

We struck out along the shore of the sea, traveling almost due west—toward the great disk of giant Jupiter. For about a mile we encountered no forms of animal life, then we suddenly emerged upon a sandy, broken hollow about a half mile square. For a moment we debated as to the wisdom of continuing across this area, but as nothing stirred, we decided to keep on.

ACCORDINGLY, we strode down into the sun-bathed valley. About half way across, our course suddenly rounded a large boulder lying in the hot sand, and as we were passing by it, we came to an abrupt halt. Before us were seven new monstrosities—seven feet tall from their small, aristocratic, high-arched feet to the tops of their great globular heads—and in his

dainty right hand each one clutched a glass rod about two feet long. For a long minute we faced each other —these creatures of Ganymede and we Earth-men. During this period I was enabled to see the creatures more carefully. Their heads were almost perfectly round, about two feet in diameter, and perfectly hairless. Their features were human—two large, round eyes, almost white, except for the pupils, but the lids were very thin and delicate, and there were no eyebrows or hairs on the lashes. The noses were long and thin. In each case the mouth was small, the lips full and very red. The chins were long and pointed. Their bodies were rather narrow-shouldered and tapered down to thin waists, narrow hips and long, slender legs. Altogether they made me think of so many upright wedges. The color of their skins was an extremely light tan. As I appraised these beings I had to wonder how those frail-looking, slender legs could support the great heads, which alone, I reasoned, weighed as much as all the rest of the body. Their apparel was simple, consisting of a soft leather loin cloth and a number of thongs which supported a long crystal knife at the left hip, a leather pouch at the right, and a socket to hold the glass rod each individual now had in his hand. These latter next focused my attention. They were about two feet long and about an inch in diameter, with the forward end nicely rounded. In the center of each one was a slight bulge and there I saw what looked like a couple of small mirrors connected to some fine wires.

"Vacuum tubes," I correctly inferred.

Of course, you realize that this appraisement did not take as long as it did for me to write it, or you to read it. It took but a few seconds for me to note what I have set down above.

Then one of these strange men spoke. He seemed to be a sort of leader, as indicated by the fact that he alone wore a shining talisman about his neck. The bauble caught my attention. It was circular, about the size of a silver dollar, and seemed to be of gold. In the center a red-brown crystal that I took for a garnet was inset.

Of course, Rosonoff and I had no idea what the man really said, but from his tone I inferred that he was asking us who we were and what our business was.

After a moment of painful silence and deliberation, Rosonoff essayed a reply.

"We—that is—ah—you—we cannot understand," he ended lamely.

"You cannot?" asked the creature, in apparent surprise.

At that I nearly fell over.

"You speak English!" I cried. "How do *you* know our language?"

A sneer curled the man's full red lips.

"How can you—" he started, then his knowledge of English apparently failed him and he gushed forth in his strange tongue again, and I discerned a trace of anger and indignation. Then in a short, sharp tone he snapped something at his men and they came quickly, menacingly toward us.

I raised my rifle.

"See here!" I snapped. "What's the big idea? If you are aiming to capture us, you've got another think coming. We're willing to let you alone, and we don't intend to stand for any fooling in return. Get that?"

The officer was, to all appearances, too angry to reply. The soldiers, as I guessed them to be, came steadily onward, in wrath and menacing.

Quickly I threw my rifle to my shoulder and fired at the nearest man. I did not aim, but at the report, he opened his eyes wider, threw up his hands, turned half-way round and lunged upon his face—stone dead.

The audacity of my act caused the others to come to an abrupt halt, amazement and incredulity written large upon their light tan faces. Then, with wild cries of wrath, they leaped forward. A cry broke from the leader.

I dropped my rifle, jerked my revolver from its holster and fired twice in quick succession. Behind me Rosonoff's gun also spoke.

Then the leader raised his glass tube, it glinted in his hand and I reeled. A brief instant things were blurred and swimming before my eyes—then all was gone.

I OPENED my eyes. For a moment I could not grasp what had occurred, but then consciousness fully reasserted itself and I looked quickly about me. I was lying on a rude litter of boughs, borne on the shoulders of four men—not the men who had fought us in the little sandy valley, but men like myself. I could see the backs of the heads of the two before me —they seemed to be built exactly like the heads of Earth-men, and were covered with thick shocks of black hair.

The leader of the tan men loomed up beside me. I could not close my eyes quickly enough to pretend unconsciousness, so he halted the men and motioned me to descend.

As my feet touched the ground, I saw that this was a chain of slaves, for there were about fifty white men of my own build with heavy chains about their waists and linked to the men before them. Rosonoff, I saw, was also afoot, and chained like the others. Several of the slaves carried litters like the one I had been in, and in three of these I saw the bodies of tan men, one in each litter. So Rosonoff and I had gotten three of them, eh? Despite the gravity of our situation, I managed a little smile.

While I was chained into the train, I became aware of the fact that some of the white slaves were regarding me with faces that denoted wonder and awe.

I noticed that the men were very handsome, with regular features, grey eyes and black hair. They were garbed in vari-colored tunics that fell to the knees and left the arms bare. There were no weapons among them, but the empty sockets at their belts showed that there once had been. I did not need to look at my belt to see that my revolver was gone.

Again the march was resumed—whither? I endeavored to determine our direction by noting the positions of the stars, and so I looked up to see if I could find the broad disk of Jupiter. A hasty glance around

showed me that it was behind us, and that we were marching directly away from it. I wondered how long we had been unconscious, Rosonoff and I. My watch was gone when my hand ran over the pocket in my trousers.

For a day my companion and I did not attempt to speak to these men, the Moon Men conversing only among themselves. Several times we saw them address the large-headed tan men, and each time elicited a response. But it was easy to see that the tan men considered the members of the *Genus Homo* as being vastly inferior beings, and only spoke to them on the grounds of common decency.

"Hm," muttered Rosonoff, who was chained right behind me, "they have a common language. We shall have to learn it."

"Oh, I don't know," said I, "those big pear-heads could speak English, so why waste a lot of energy learning a new language, when we can get along just as well with the old?"

Rosonoff shook his head.

"I cannot conceive of any way they might have learned it, except perhaps by capturing earthly radio waves with very powerful receiving sets. It is apparent that English is not their native tongue, nor is it the native language of our fellow captives."

We entered a thick, primeval forest about an hour later, and marched a long time when the gloom in the wood deepened, and the Ganymedean night came upon us. The tan men herded us into a rough circle at the base of a high, perpendicular cliff wall. We were given some kind of meat, broiled over a fire in the middle of the clearing, then six of our captors lay down to sleep, and two remained on guard. The three dead men were left in their litters.

The morning after the long, chilly, dark Ganymedean night, we again resumed the march. Rosonoff and I began to speak to our fellow prisoners, but, of course, we could not understand each other.

However, two handsome young fellows took it on themselves to be our tutors, and being eager students, we managed in a little while to exchange thoughts. Signs and actions were our chief methods of intercourse at first, but by the time we reached the capital city of the Ja-vas, as our captors were called, we were able to speak our friends'—and enemies'—tongue fairly well.

I told Thoom, one of our instructors, and to whom I became much attached, that we were not of his world, but from the planet Earth, and tried to explain to him a few of the essentials of astronomy, for though he had often seen the stars, his knowledge concerning them was about as high as that of the early Greek and Roman students on our own Earth.

"That may be, my friend," he said with a wistful smile, "but I fear that you are telling me these things when they will be of no use to me whatever."

"What do you mean?" I asked.

"The Ja-vas—" replied Thoom, and shrugged his shoulders.

"You mean they'll kill us?" I queried, with a rather creepy sensation along my spine.

Again he shrugged.

"I do not know. All I know is, that whoever falls into their hands never returns to his people."

"Deuced cheerful prospect," I thought to myself, and at the same time I decided that I, at least, would not be one of those who never return.

And then, the next day, nine days since our capture, we came at last to the Ja-vas capital.

Chapter IV

The City of Glass

WE had debouched upon a flat, grassy plain, from the shadows of a forest, when I first sighted the shining domes and glistening spires of Putar, main city of the Ja-vas. Where the forest stopped began the fields and pastures that fed the city, the gardens laid out in squares and triangles and circles that showed they had been very accurately measured. Between the plots ran broad paths of gleaming white stone, and along one of these we were conducted to the wall of the great city. This wall we followed to a gate, where the captain of our guard spoke to the sentinels, who ordered the gate opened. The huge portal noiselessly sank back some ten feet, then it moved to one side. We passed within.

Wide avenues of the white rock stretched before us, while from beautiful green lawns rose the towering buildings of polished glass, the ornamental figures thereon dividing the sunlight into all the colors of the spectrum. As angles and prisms abounded in the ornamental effect of the buildings, the whole city seemed garbed in a shimmering veil of rainbow-hued luminescence.

On the streets were several parties of the tan Ja-vas, attended by strings of white slaves wearing green tunics.

We were marched to a low-walled courtyard, admitted within and taken to a subway, where we descended some fifty feet, and then followed it for about three miles.

This subway was crowded with throngs of Ja-vas hurrying here and there, while in the center of the passageway, at a slightly lower level, ran polished rails of steel, on which metallic, cigar-shaped vehicles swiftly and noiselessly sped by us.

On either hand the glass walls rose to the arched roof, broken at intervals by doors and gates, while in the center of the arched ceiling ran a row of circular apertures, about thirty feet apart, and each about three feet in diameter. Some were open and permitted the light and air from outside to enter; others were closed, but served as lamps, as the lids were artificially lighted; still others were closed and unlighted.

At the end of our three-mile journey, we ascended to the surface of the ground, to find ourselves in a small chamber, facing a great, marvelously beautiful lawn. About five hundred feet away, partly obscured by tall, green, well-pruned trees, rose a magnificent structure, with a dome like that of St. Peter's at Rome.

We were taken toward this edifice, a Ja-vas officer accompanying our original eight guardians. The three dead Ja-vas were left at the guard house. It had

always been a source of keen wonder to me why no signs of putrifaction had set in on the bodies during our long march to Putar, when Ganymede's days are seven times the length of the Earth's. I assumed that the bodies had been treated with some chemical, to keep them from decay.

We emerged from the shadow of the trees surrounding the magnificent structure, and were taken up a broad flight of stairs, through a great arched portal into a long, beautiful hallway. Halfway down it we turned into a room where some fifty Ja-vas were doing a lot of writing and pinning metal tags on several hundred slaves who were chained in trains like ours.

After about twenty minutes, our own chain was brought before a marble desk and the Ja-vas, in whose care we were, gave an account of where he had found his prisoners, their conduct, and so on, while the official seated in the throne-like chair made out a detailed report on paper. Then he picked up the metal tags lying beside him, noted the heiroglyph on each one on his papers, and pinned one on each individual.

Presently I came up.

"Your name?" asked the man in the chair.

"Clyde Bachus."

He made a sinuous mark on the paper and crossed it twice horizontally. Then he looked up at me.

"An unusual name," he commented.

"Yes, it is," I agreed, thinking, not of Ganymedean nomenclature, but of terrestrial. I often wondered why my folks hadn't named me John, or Tom, or something sensible like that.

The Ja-vas stared at me in silence awhile.

"How old are you?" he demanded next.

"Thirty-two."

"What!" he shot, jerking his head up so suddenly I thought it would fly off.

"Thirty-two years," I replied again, looking at him in mild surprise.

The officer went white with anger under his tan skin.

"I am not to be trifled with," he almost shouted, "I want a sensible answer!"

"Why—why," I stammered, "I—I—I'm telling the truth. I don't see anything remarkable about my age. I am thirty-two years old, as God is my witness!"

The Ja-vas regarded me as if he did not know whether to break my head or accept my word. He looked long into my face, then his eyes ran down my body.

Presently he cooled off a little.

"You wear odd clothes," he stated next.

"I presume they would be to *you,*" I replied.

HE stood in silence a moment, then he called over the officer of our train, and the two spoke in low tones for some time. Finally our leader came over, unchained Rosonoff and me, and motioned us to one side. We waited till all the remaining slaves of our train had been registered and checked, then, while some officers marched them off, we were taken out into the air and led to a low building. In this we were taken down a flight of stairs, and finally into a little cell, where our guard left us, locking the single door behind them.

"Well—?" said I to Rosonoff.

He sighed and shook his head. "I don't know what they will do next," he said.

We waited for some time in the little cell—how long we could not guess, for the Ja-vas had relieved us of our watches, and, as the room was underground and was artificially illuminated, there was no way of keeping track of time. Finally, however, two Ja-vas opened the door and told us to accompany them.

We were again conducted to the gorgeous edifice, and led along a wide, marvelously decorated hallway to a great chamber in the center of that massive pile. We were ushered into this room, which was circular, about four hundred feet in diameter, and from the center of the great dome to the floor was about another four hundred feet. At the farther end was a dais raised about three feet from the floor, and on it sat a Ja-vas with a head nearly a yard in diameter. His few trappings were of braided, flexible metal, which I judged to be platinum, and were incrusted with gleaming, precious stones.

When Rosonoff and I were halted at the foot of his throne, we were told to prostrate ourselves upon our faces, but we made no move to do so.

"Who are these creatures, that they obey not the commands of the Ja-vas—that they do not pay due homage to the Chosen One of the Life-Spirit?" demanded the Ja-vas on the throne, speaking to the officer who accompanied us.

The tan man bowed very low.

"O, Great One, I know nothing of these strange ones, save that they have committed crimes against the Holy Race that are terrible in the highest degree.

"When I, thy servant, and my ten soldiers, found them and asked them to surrender, they replied in a tongue we had not heard before, but which, of course, we could easily understand. When I replied to them in their own language, the young one had the audacity to ask how we could comprehend.

"Seeing that they were not disposed to surrender without force, I commanded the Ja-vas with me to take the strangers by force. But as soon as the warriors moved, this one"—he indicated me—"used a queer weapon employing the ancient principle of expanding gases, to hurl a small leaden pellet at my warriors. The two of them had exploded their weapons four times, and, as a result, three of the Holy Race fell victims to the little missiles ere I could bring my ray to work on them.

"That is what they did at their capture, O Chosen of the Essence!"

The Ja-vas stepped back with his former low bow, when another moved up. He was the Register we had met before.

After also bowing, he spoke:

"O, Mighty One, Voice of the Life-Spirit! I, too, must tell of these strange ones' conduct.

"When they were brought to register, I first asked this young one his name, which he replied was Clyde Bachus. Next, when I demanded his age, this creature

had the temerity to play upon my gullibility by telling me he was *thirty-two years* old! Nor did he show the deference due a Ja-vas, for he stood unabashed before me when he said this, and even called upon the Essence, whom he named 'God,' to testify to the truth of this absurd impossibility. That he shows such audacity before the Holy Race, would indicate that he came from some unexplored part of Nomak, where none of the Chosen People have as yet penetrated.

AFTER the tan one had retreated, the Chosen One looked long and hard at Rosonoff and me, but his face gave no hint of what was passing in his great brain.

Finally he spoke, addressing me, for I was the more accused.

"I know that my subjects have informed me correctly. Is there anything you have to say to explain your highly unconventional conduct toward the Holy Ja-vas?"

"I have. I lay my hostile attitude to the fact that the Ja-vas interfered with, and menaced my freedom of action and desire by attempting to capture me. When I fought them, it was in defense of my rights. As to this matter of my age, I see nothing about it to cause anyone to assume a belligerent disposition. I am thirty-two years old, and in my country all men reach that age and more, except those who die by accident, design or disease."

The Ja-vas on the dais regarded me a while longer.

"What is your country, and where is it?" he wanted to know next.

"I am a citizen of the United States of America, Earth," I replied. "It is a country very far from here. It is not even on Nomak."

Nomak, I might remark, is the native name of Ganymede.

"Oh, I see! Then you are from one of the other moons that circle the giant home of the Life-Spirit?"

"Yes!" broke in Rosonoff, before I could answer, and I thought that I detected a trace of anxiety in his tone.

The Chosen One glared at the Russian.

"No one asked your interference," he said in a cold, quiet, deadly voice. He turned to me again and asked if my companion had spoken the truth, and I, realizing that for some reason Rosonoff wished me to say so, answered in the affirmative.

For a long time the Ja-vas on the throne regarded me in silence. At last he spoke.

"I do not believe most of what you have said. You are from some portion of this planet, and later on I will find out which part. The rule of the Ja-vas must be extended to this place. In the meantime, you will be treated like the other slaves, and work with them. I leave it to the Chief of Industries to assign you your vocations until I am ready to see you again. I will call for you when I am ready.

"Go!" and he pointed to the great doorway.

The Ja-vas accompanying us motioned us to come along, and after bowing once more to the Ja-vas ruler, they led the way back to our little cell.

Chapter V.

The Moon Girl

"THAT'S that!" I said, when the guard had left. I sat down on a rude bench at one end of the room and moodily contemplated our future—though there seemed little enough to contemplate.

"This is a fine mess we are in," Rosonoff informed me. As if I didn't know that!

We lapsed into silence.

Presently the lock grated, the door swung open, and our two Ja-vas stepped in.

"Come! You are going to work," one of them told us, and we rose to accompany them. If I intended to escape from this place, I told myself, I couldn't do it as long as I remained in that little cell. Apparently Rosonoff was in the same frame of mind, for, as he rose, he looked at the Ja-vas with a speculative gleam in his eyes.

We were taken out into the sunlight, across the great park into the tall glass building. There we were checked and registered, and led down a broad flight of stairs to an underground tunnel, where stood several trains of slaves, apparently awaiting orders. We were put in one of these trains, though we were no longer chained.

A few moments passed, then we were ordered to march. We followed the tunnel to our right for about five miles, where we descended a broad spiral runway. This we followed downward for some distance. I estimated that we had gone down about three hundred feet, but as the spiral was about a quarter of a mile in diameter, and dropped about fifty feet in every circumference, we had marched some five miles more.

Then we debouched into a great cave of deep scarlet. I immediately perceived that it was not artificially illuminated, but that the beautiful red rock that walled the cavern's sides shone with a subdued luminescence which acted as a natural lantern.

As we marched along one wall, I noticed that it was very smooth and straight, and I correctly inferred that it had been cut so by the slaves who were now beginning to work.

A string of laborers passed us, on the way out. I counted a hundred of them, under four Ja-vas guards. They were transporting blocks of the red stone on low wagons, on which the rock was strapped, four slaves pulling each wagon. Twenty-five of these wagons passed.

Presently a Ja-vas officer came up and addressed the leader of our company.

"This *entav* will transport," I heard him say. "Use the trailers marked 'seven.' You will go to section *7* and work two *jens*,* after which a relief shift will take over the work. At the beginning of the seventh *jen* you will resume your activities."

Our captain nodded acquiescence, and led us across the great cavern. At the farther side, which was about one thousand feet from the entrance, we found a group of twenty-five empty trailers standing before

* About 8 hours 22 minutes, Earthly reckoning. A jen is about 4 hours 11 minutes.—*C. B.*

the red wall, where a hundred men were working on scaffolds, cutting great blocks from the wall and gently lowering them down upon thick, soft mats of cloth. The extreme solicitude that was utilized in the handling of this scarlet rock indicated that it was very precious indeed.

We waited until some thirty blocks had been cut and lowered, then we loaded twenty-five of them upon the trailers. I noticed that as we loaded a block on the trailer I was to help pull, the stone was crystal clear.

When all the carts were loaded, we marched toward the entrance and exit of the cave, passed through, and began the ascent of the spiral gallery. At its mouth we entered the main tube leading to the Royal Palace, and there we found a number of the torpedo-shaped vehicles waiting on the rails. There were three trains of them, pointing to the city, with four cars to a string. In these we placed the red rock, the Ja-vas seated in the pointed noses of the foremost cars started the motors, and the trains moved slowly off, then rapidly gained speed till at last they shot forward at a rate I could not even guess at with any degree of accuracy.

Then we went back to the cave, reloaded and ascended again, to find the torpedo-shaped vehicles waiting for us. We again returned to the cave and made one more trip up, where we surrendered our trailers to a new company of slaves awaiting us.

FROM there we marched along the tunnel leading to the royal gardens, for about a mile, then turned to our right, where a great gateway yawned. We were conducted through this to a broad flight of stairs leading downward. Fifty feet down was a corridor, the stairs continuing down on the opposite side thereof. At the fifth level, down, we came to another corridor, and, following this for a short distance, entered a chamber several hundred feet square, with rows of blankets stretched on the stone floor, and felt-covered blocks of wood for pillows. We were all given beds and told to wait for our rations. In a little while they arrived—a hundred slaves pushing good-sized serving tables before them, from which they delivered to each prisoner an oblong tray filled with food.

I found the food to be both appetizing and satisfying.

After eating, I felt drowsy and comfortable, and noticed my companions also looked sleepy. I supposed the Ja-vas had seen to it that some sort of sleeping potion was put into the food.

"Things aren't going so bad for us here," I remarked to Rosonoff. "The only thing is we can't do just as we please."

Stretching myself upon my simple bed, I promptly fell asleep, to awaken refreshed and vigorous some sixteen hours later, when a Ja-vas guard had blown on a brass horn; the tone penetrated to one's brain, awakening one surely, yet not too suddenly.

We rose and were given our food, which was a duplicate of our last. Then our train was gathered and we were marched off toward the spiral tunnel, where we relieved another company of slaves engaged in transporting blocks of stone.

As the train filed past us on its way to the lodging room, one of the slaves touched my sleeve and I turned to look into the eyes of Thoom. A quick glance of greeting passed between us, and then he moved away.

We took the trailers down into the cave and resumed the work of our last shift. This was our work for several days; then both Rosonoff and I were changed to different occupations. At the end of one of our shifts, our Ja-vas leader had been in a weighty conversation of some kind with another of his race, which resulted in our captain tapping Rosonoff on the arm and motioning him to accompany the strange Ja-vas. That was the last I saw of Rosonoff for some time.

Another slave was put into his place, and our work was resumed.

TWO shifts after that, I was joined to a company of slaves who transported the slaves' food to their sleeping quarters, and so I came to the great slaves' kitchens, where women did the cooking, while males brought in the raw food, and took the wheeled trays to the various slaves' quarters. There I became acquainted with the Moon Girl.

She was one of the cooks on the great oven from which my serving table was filled. I noticed her the moment I came to the oven, and was immediately struck by her exceedingly comely features. She was not merely pretty, or even beautiful—she was divine! I had seen many beautiful women on Earth, and had admired them in a way. But this woman made me whistle softly and mutter, "Boy, what a peach!" under my breath.

She looked up at me just then, and I dropped my gaze, profoundly embarrassed to be caught admiring her. But I had glimpsed her own eyes in that fraction of a second, and I drew my breath sharply. She was even more beautiful than I had at first imagined —she was ethereal.

For a while I thanked my lucky stars that I had fallen into the hands of the Ja-vas, but I suddenly realized that she, too, was but a slave of these supermen. Then I cursed the Ja-vas, cursed their superiority over the other creatures of Ganymede, cursed the fate that had thrown the Moon Girl into their power.

For several days we did not speak to each other. While I had often secretly admired women from a distance, I was uneasy and bashful whenever in their close proximity—and the prettier they were, the more bashful I became. But presently I managed to slip this girl a quiet smile and short nod of greeting whenever I went in to fill my wagon, and was in return rewarded by a friendly smile that caused me to draw my breath inward in growing admiration.

As the days passed, I began to speak to her, though shyly at first. She must have understood my ability to speak easily with women, for she encouraged me by leading most of our early conversations. I learned her name was Navara, that she was of the tribe of Itark, and that her age was twelve hundred.

"What!" I demanded, as she made this last statement.

She looked at me in wonder.

"How—how—*how old are you?*" I asked again.

"Twelve hundred days."

I stared at her in amazement. From one extremity (for I had thought she meant *years* the first time) she had gone to another and equally absurd. I wanted to blurt out, "You're crazy!" but I did not. Still, was this pretty young idiot trying to tell me she was *less than four years old?*

She noted my surprised face and regarded me curiously a moment.

"I am not quite two years old," she stated simply.

"Now I know you're crazy," I thought inwardly, and, taking a last look at that beautiful face looking so earnestly into mine, I muttered softly in English, "What a pity! Too bad, too bad!" and turned sorrowfully and silently away.

As I delivered the food trays to the slaves in their quarters, I often pondered on this conversation, but for a long time I couldn't puzzle it out. Navara didn't impress me as being mentally deficient, so I was at a loss for the correct meaning of her statements. Then suddenly, like a bolt from the blue (as the expression goes), I had the answer. An exclamation of astonishment burst from my lips at the simplicity of the affair. What a bonehead I had been! Then I sat back against the wall of our quarters and laughed.

"Idiot, lunkhead, fool!" I derided myself amid my laughter. Of course, that was it! The Ganymedean day was seven times the length of a terrestrial one, so Navara was really 8,400 Earthly days old. I procured a sort of pencil which we waiter-slaves carried, and on an old report did some, for me, complicated mathematics. The result was that Navara's terrestrial age was 23 years, 5 months, and 5 days. This was, of course, including the 3 hours in seven Earthly days which the Ganymedean day contains. This bore out her statement that she was nearly two Jovian years old—the year of Jupiter being 12 times the length of our planet's.

This also accounted for the amazement of the Ja-vas when I informed them that I was thirty-two years old. I was figuring along Earthly standards, while they, naturally, used the Ganymedean way of reckoning. Thirty-two Jovian years equal three hundred and eighty of ours, or so. The average Ganymedean man lives to an age of six years. When he is three years old he is in the prime of life.

So I laughed again and curled up to sleep, with the knowledge that I owed the Moon Girl an apology for the uncouth stares I had given her in regard to this matter.

At the beginning of my next shift, when I loaded my serving table, I apologized for my unconventional actions, and told her that in my country we had a different mode of reckoning, which I had confused with her system. So we laughed it off. She wanted to know where my country was, but fearing that she might consider me crazy if I told her the truth, I said I came from the North Polar regions of Ganymede. Apparently she believed me, but I felt like a criminal—lying thus to Navara.

So the long Ganymedean days passed away, while the friendship between Navara and me constantly grew. Since I was separated from my old friends, she was all I had, and I cherished her, as I had never cherished anything before, though I did not at the time realize it.

Then I presently told her the truth about myself, told her of the wonderful world from which I had come, told her of my companions, told her of the *Space-Waif* and its perilous voyage, told her of my adventures on Nomak.

I told her, too, that some day I would escape from the Ja-vas, and then I would free her, too, and bring her back to her people.

And as I told her these things that day, my dream was even then building up—had already taken shape, in fact—though neither Navara nor I suspected it.

Chapter VI.

The Escape

THE escape came sooner than I anticipated. For a long time I had been waiting for some opportunity to make my "getaway," but the unrelaxing vigilance of the Ja-vas guards immediately discouraged my every half-hearted attempt to secure weapons and attack my masters. Then, suddenly, when I thought least of escaping, that precious thing, a means to escape, was placed within my grasp, and I was not slow in taking advantage of the situation.

I had just returned from the kitchen, where Navara had fed me; and prior to rolling into my blankets I had picked up a moldy manuscript that the Ja-vas had left lying about in case some slave should desire to read. I had mastered the Ja-vas written language fairly well, and spoke the tongue with some fluency.

So now as I turned the knob on one side of the frame, which action turned the paper, I happened to glance casually out into the corridor. Immediately my lagging interest was aroused—for there stood Alexander Rosonoff, looking straight at me. When he saw I recognized him, he put a finger to his mouth and with his other hand waved me down.

Nonchalantly I tucked the book, if I may so call it, under my pillow and crept into my blankets, still keeping one eye cautiously on the Russian. I saw him glance quickly up and down the gallery, then he pulled something glittering from his tunic and quietly stepped into our room. The backs of our two Ja-vas guardsmen were turned toward him when he entered, so they did not see him level his weapon, which I recognized as one of the vacuum tubes carried by the Holy Race, at them. A sudden glint shot from the wires in the glass tube, and I saw our two guards drop their weapons, turn partly around, and sink to the floor, dead.

At Rosonoff's motion, I jumped from my blankets and bounded toward him, using my Earthly ability fully for the first time. My single leap carried me clear across the chamber—a distance of some eighty feet.

"Take this!" whispered the Russian, thrusting one of the guards' tubes into my hand. He showed me how

to turn the graduated dial on the handle of the rod to get the power of the tube to kill, paralyze, or merely stun a person.

The clatter of the Ja-vas' weapons had aroused the slaves, and now they were gathered about us, awe and terror mingling in their expressions.

Rosonoff addressed them.

"Slaves!" he cried. "Here is your chance for freedom! Many of you have slaved in this city for long times. You have families and loved ones back in your own tribes, and you would like to return to them. Come with us, fight with us, take a chance to regain your liberty! What say you?"

A moment of silence, then a young fellow who had been recently captured, spoke up.

"I am with you! If we succeed, all well and good, if we do not succeed, they can do no more than keep us prisoners. If I were to remain here, what difference would it be between captivity and death?"

Rosonoff gave him the other tube and explained how to operate it, then turned to the other captives.

"We three are going," he announced. "How about you?"

They decided to accompany us on the venture, and so we all set out for the cavern of the red rock, where Rosonoff intended to release Thoom, should he be there, and the other prisoners.

When we got to the intersecting passage that led to the slaves' kitchens, I left the company, telling the Russian that I wanted to free a friend of mine.

I arrived safely at the kitchen and looked within. The female slaves had just finished their work and were falling into line to be led to their quarters, while the new shift was preparing for work. I spied Navara at the head of one column, preparatory to leaving the room. I decided to wait till they emerged from the chamber ere I acted, so I stood back against one wall and waited.

Presently the Ja-vas guard stepped through the portal, and as he did so I raised my tube and pressed the button. Without a sound the tan man sank lifeless to the floor.

I bounded to his body and picked up the tube, pressing it into Navara's hand, as she and the other women came from the room. I whispered to her to say nothing and follow me. Then I lifted the body of the dead Ja-vas, whose weight was as nothing to my Earthly muscles, and set off toward the main passageway. Finally I saw a dark niche in the wall and I deposited my burden there. Then I strode beside Navara, told her of Rosonoff's attempt to escape and showed her how to manipulate the vacuum tube.

AT the main corridor, we turned to the right—toward the cave of the red rock. Occasionally the torpedo-shaped cars passed us, but these were moving at such speed that the Ja-vas within them certainly did not notice that all was not in the regular order. Presently we began to come upon bodies—dead Ja-vas lying on the pedestrian's walks, all stripped of their weapons.

We had counted thirteen dead Ja-vas when we reached the spiral runway, where I was to meet Rosonoff.

There we beheld quite a concourse of slaves, a score of them armed with the glass tubes of the Holy Race. Several blocks of red stone lay on the ground, and about thirty of the torpedo-shaped vehicles waited on the rails.

The first to greet us were Rosonoff and Thoom. As the latter stepped forward, Navara gave a little cry of joy and flung herself into the arms of the Ganymedean. I stopped and gazed open-mouthed as he took her in his arms and kissed her a thousand times, and I admit I was jealous—terribly so. For a minute an insane hatred of Thoom burned in my heart, but then I brought myself to my senses. I might have known she had a sweetheart or a husband. Doubtless she had had scores of suitors for her hand.

I tried to tell myself that I was glad Thoom had won her—rather than another, for Thoom was physically and mentally a splendid specimen of the Genus Homo. But deep down in my heart I was not glad—I was miserable. I just began to realize what she really meant to me.

I turned sorrowfully away—I wanted to lie down somewhere, alone in my grief, and die—but Navara suddenly called me. I turned again and walked slowly and silently to where she stood beside Thoom.

"Clyde," she cried joyfully as I came up, "this is my—"

"We know each other already, dear. Clyde Bachus and I were in the same slave train when we came to Putar," broke in the man, as he grasped my shoulder in friendly greeting.

"Yes," assented I.

"Come!" exclaimed Rosonoff, "You three get into the first car with me!" and led the way to the torpedo-shaped vehicles. We entered the first one, in which some six more Ganymedeans were already placed, Rosonoff at the instrument board.

He waited till the other cars were filled, then he started the silent motors and we began to glide off.

"Where did you learn to drive these things?" I asked him, wondering at his proficiency with Ganymedean inventions.

"You remember when I was taken away from the quarry?" he asked in return. I nodded. "Well," he continued, "that Ja-vas wanted a driver for his private car, and I got the job. I was taught to handle these cars, learned the communication system employed in them, you know, for speaking with Ja-vas in the other cars and so on, and learned all the different railed tunnels of the city. There are a number of other things I also learned, as you will presently find out."

We had now worked up quite a pace, which was steadily increased till in a minute we shot forward at a speed of several hundred miles an hour.

"See here, won't we get wrecked keeping up at this rate?" I demanded of the Russian.

He was busy working a lot of buttons and it was a minute ere he spoke. "I'm sending messages to the switches ahead that a 'special' is coming through. Of course, we can't turn sharp angles at this speed, but there's a big quarter-circle at one place that will steer

us to the right. Then we go up"—he pulled a couple of levers and I caught a glimpse of colored lights outside the glass windows—"and move along the surface for a couple of miles."

Presently we were shooting toward a red light in the center of the tunnel, miles away yet, and I turned again to my fellow Earth-man.

"How did that light get there? A minute ago there was just a blur, as far as I could see."

"We are past that curve. While we were rounding it the outer rails were raised by the switchmen. We didn't notice that because of our speed."

Then the red light began to sink, and in another second we were traveling in a blue-vaulted tunnel with green walls.

"We're out in the open," announced Rosonoff. He touched a button and pulled some levers and knobs. Gradually the high hum caused by our speed lowered, and in twenty minutes it was almost all gone. Rosonoff touched another button and applied the brake. In ten minutes we had come to a halt.

We all left the cars and looked about. We were in a little grove of trees, and here Rosonoff ordered the rest of the slaves to remain while he, Thoom, and I attended to some business.

THE three of us left the glade and moved toward a low structure standing in the middle of a green field. Hiding our tubes in our tunics, we entered the place. A Ja-vas sentry who accosted us was quietly put to death by the ray, which Rosonoff used from under the folds of his clothing. Then we were in the single great room of the building. It was simply filled with great torpedo-like machines—some about ten feet long and three feet in diameter, others a hundred feet long and thirty feet in diameter. There were all sizes of these torpedoes in evidence. A dozen Ja-vas loitered in the chamber, none of them, however, paying any attention to us.

At Rosonoff's whispered "Now!" we three turned on our rods and swept the room with their invisible beam. The Ja-vas soundlessly sank to the floor in death. We quickly moved forward and relieved the bodies of their tubes.

"By the way, Mr. Rosonoff, do you know what ray these tubes employ?" I asked.

"Yes. These are highly developed cathode ray tubes—about the same thing invented by Dr. Coolidge a while ago, back on our own planet. Apparently the Ja-vas have learned to 'tune' this beam so that it causes death to animal life in some way I have not yet determined. You have doubtless noticed that we are about two thousand years farther advanced along the scale of civilization than Thoom, while the Ja-vas are several thousand years in advance of us."

When we had collected the tubes, Rosonoff and Thoom went to the cigar-shaped machines, while I went back to call the rest of the Moon People.

Arriving again at the structure, we found one of the big machines lying out on the open plain.

"Who of you are from the tribe of Karnek?" queried Rosonoff, addressing the slaves.

In response, about two hundred stepped forward. "Who are of the tribe of Sira?"

All the remaining slaves save three moved into another group. Only Thoom, Navara, and an old man remained.

"Do any of you know how to operate these?" next asked the Russian, indicating the great machine.

Two men responded, one was the old man who was left with Thoom and Navara, the other was a man of Karnek. Rosonoff took these two and returned into the building through a great open portal, and presently a great cigar floated through the gate, several feet from the ground, to come down a hundred feet from the structure. Following this was a smaller flyer that came down beside Thoom and Navara.

Rosonoff stepped out of the larger. "Clyde, you will go to Itark in the smallest flyer with Thoom and his—?" he looked at the Ganymedean inquisitively.

"Sister," supplied Thoom.

"Sister!" I echoed, my heart giving such a bound of joy that I thought it would leap from my bosom, "I—I thought you were mates!"

"Oh dear, no!" laughed Navara, while Thoom grinned and then regarded me quizzically.

"Now," broke in Rosonoff, "we must work fast. Clyde, get into the machine with your companions. I will see you in Itark shortly. You—" he pointed to the Karnekian, who also knew how to operate these aircraft—"take your people in the largest machine and fly to your country. I will leave in the other machine in a little while."

He turned and re-entered the structure, while the rest of us boarded our respective aircraft.

In our machine the old man, Goor by name, took his seat at the control board, pulled a few levers, started the silent motor and we gently rose into the Ganymedean air. Through our glass windows I saw the Karnek ship also rise and move majestically off to our right. Presently I saw Rosonoff emerge from the building, jump into the remaining ship, and then that also rose and swiftly moved off to the left.

Our own was gathering speed now, and I was glad it was, for below us I saw a string of the torpedo-shaped ground trains come to a halt behind the ones we had just abandoned, and from these pursuers a hundred Ja-vas leaped. A faint cry of rage came to our ears, then they dashed into the aircraft structure. The last one had just disappeared in its entrance, when a great column of smoke and fire and stone and metal shot into the air, while the rest of the building crumbled and collapsed.

I grinned. Rosonoff had planted a bomb in the building when he entered it the last time. We were safe, for the time being, at least.

And now we were shooting along through the air of Ganymede toward the west and safety.

Chapter VII

My Last Days on Ganymede—Back to Earth

ABOUT eight hundred miles had passed beneath us when the flyer developed signs of some sort of motor trouble. This constantly became

worse, so we decided to land and continue the journey on foot. Goor knew how to drive a Ja-vas aircraft, but he knew nothing of the engine's construction. And, of course, the rest of us were of no help at all.

Goor brought the flyer to rest in an open field, and we all disembarked, to continue the remaining two hundred miles to Itark on foot.

After orientating ourselves, we marched across the field and entered the dense forest beyond. I had always wondered how three distinct geological conditions could exist contemporarily. It seemed that along Ganymede's equator lies a strip of country in which flourish fauna and flora like that on Earth millions of years ago; a little farther on either side is the country of men, like Thoom and Goor; in Ganymede's temperate zones is the Ja-vas country, though these have extended their supremacy over the whole planet; and what is at the snow-covered poles, no one has ever discovered—not even the Ja-vas. Perhaps some super-race lives there, perhaps the poles are only desolate, lifeless spots on this Jovian moon.

The first catastrophe occurred within a minute after we entered the forest. Goor, who was in the lead, suddenly gave a cry of warning and leaped back, lashing furiously at something with his tube, which he used as a club. Pushing Navara into the bushes, Thoom and I leaped forward, to find Goor lying dead on the moist ground, while a great black snake uncoiled itself from around his body. Thoom sent his cathode ray against it, and it sank down lifeless upon the breast of its victim. Rolling Goor's head to one side, we found on his cheek two long scratches, where the serpent's poisonous fangs had buried themselves in his face.

Somewhat shaken and nervous, Thoom and I cast aside the snake and dragged Goor's body to a great rock. After some strenuous pushing and shoving, we finally managed to push the rock from its bed, which was about a foot deep, deposited Goor's corpse therein and pushed the rock back again.

Then we called Navara and we moved on again, a silent, cheerless company.

For three more Ganymedean days we marched on ere the second calamity befell us. Thoom and I had alternately hunted food for the party before going to sleep, and now, on this fourth day, it was Thoom's turn.

He took up his cathode ray tube, nodded to Navara and me, and vanished into the forest.

A half hour passed—an hour, and no sign of Thoom. Navara and I were getting anxious.

"I'm going to search for him," I said, and, picking up my tube, followed into the green maze. For a few minutes I was able to trace Thoom by his footprints in the soft loam, but presently this stopped, and I was baffled. I had taken some pride in my woodcraft back in Montana, but in this jungle, with its fallen trees, rocky stretches, and tangled mazes, I might as well have tried to trail a ghost.

Night came on—I searched for some time, then I managed to make my way back to the "camp."

Thoom had not returned, and though we waited here five days, and I made searches for him every day, we never saw him again.

Then we resumed the march again, just Navara and I. Three days passed well, the next we would be in the main city of the tribe of Itark.

The next day we stepped out again at sunrise, and for an hour all went well. Then suddenly, as we were moving across an open glade, a loud hiss broke on our ears, and a great saurian came upon us from the foliage on the opposite side of the clearing. It was a *Cerataurus-Ganymedeus*, or as the Ganymedeans say, a *Thordok*.

We turned to flee, but ere we had covered half the distance to the nearest trees, the creature was upon us. Then the feel of the vacuum tube in my hand startled me into action. I turned swiftly and pressed the button. I turned cold with terror; for the tube refused to send out its death beam, and the dinosaur came steadily onward.

"Navara! Your tube!" I cried desperately.

She turned with a hopeless look in her eyes. "It's broken—it hasn't worked since yesterday!"

"Then run to the left as fast as you can!" I cried, and turned to face the *Thordok*, now no more than a dozen feet away. I yelled at it and jumped and gesticulated in order to attract its attention to me and away from the Moon Girl. My efforts succeeded, for its long neck shot out toward me, and but for a timely backward jump on my part, that monster would have had me then. As it was, the end of the great beak struck my chest, ripping a long, deep gash in it, and sent me sprawling to the ground a few feet further on. Again the devilish head shot out, and again by my Earthly agility was I saved, for I leaped quickly to one side as the long fangs buried themselves in the loam.

I had barely leaped to my feet when a cry of dismay from Navara broke out, and she rushed toward the dinosaur. She seized the great, spiked tail as though she wanted to pull those twenty tons of demoniac fury from me by force. This seemed to irritate the beast.

The tail swept to one side, dragging the girl's frail body with it, then it lashed out like a great whip, and Navara's divine form was hurled high into the air, coming down clear on the one side of the clearing, a hundred feet from where I stood.

"Navara!" I screamed, and leaped toward the clump of fern-like trees behind which she had fallen. A single bound carried me to them, and there I stopped, aghast with horror. For, there, before me, dropped a cliff fully five hundred feet to the floor of a rock-strewn plain that ran down to an azure sea. And hurtling down toward the plain was a woman's body, clad in the green tunic of a Ja-vas slave—*Navara!*

Once it turned and a faint cry of horror floated up to me—then—

I groaned and fainted dead away.

I DO not know when I awoke—perhaps I was unconscious an entire Ganymedean day, for the sun and giant Jupiter were in the same positions. For some time I tried to remember what had happened. Then

my memory reasserted itself—the dinosaur, Navara's body tossed to the cliff edge, her fall—

I shuddered and leaned over the cliff edge, then I sank back, sick with horror. Below me still lay the lifeless body of the Moon Girl.

For a long time, it seemed to me, I sat disconsolate and sorrowful on the cliff, my eyes uncomprehendingly scanning the strangely familiar landscape. Presently something glittering down in the valley, perhaps a mile away, caught my attention. It seemed to be a conical shell of some sort, lying on a narrow ribbon of green close to the blue sea. I looked more attentively, then the truth flashed through my mind—*it was the Space-Waif!*

I rose to my feet. At least, there would be Lloyd, dear old Lloyd, and Lenhardt, and Benson, to greet and comfort me. I set out along the cliff edge and presently found a place to descend to the plain, and from there I managed to find my way to the sea and the *Space-Waif.*

As I approached the flyer, everything seemed curiously deserted, and even before I opened the door. I knew the truth—my fellow Earth-men were gone.

Despondently I entered and gazed about the dreary, cheerless, dark interior of the space-flyer. A bundle of papers lying on the table might furnish a clue, I thought, so I picked them up and read them.

The top sheet was a short note addressed:

"To either Clyde Bachus or M. Alexandre Rosonoff:

"Dear friends—we, Erich Ludwig Lenhardt and Henry Lloyd, have on this 23rd day of June set out to find you if it is humanly possible to do so. You have been gone three months now, and we have scoured the immediate country in fruitless search for you. This note is left here in the event that you return before we do. We shall be back in about one month if all goes well.

Henry Lloyd."

Beneath this note was a sheet of foolscap and on it

The Sunken World

By **STANTON A. COBLENTZ**

THE world of literature is full of Atlantis stories, but we are certain, that there has never been a story written with such daring and originality as "The Sunken World."

Science is pretty well convinced today, that there was an Atlantis many thousands of years ago. Just exactly what became of it, no one knows. The author, in this story, has approached the subject from a totally different angle than has ever been attempted before; and the idea, daring and impossible as it would seem at first, is not impossible. Nor is it impossible that progress and science goes and comes in waves. It may be that millions of years ago, the world had reached a much higher culture than we have today. Electricity and radio, and all that goes with it, may have been well known eons ago. Every scientist knows that practically every invention is periodically rediscovered independently. It seems there is nothing new under the sun.

But the big idea behind the author's theme is the holding of present-day science and progress up to a certain amount of ridicule, and showing up our civilization in a sometimes grotesque mirror which may not always please our vanity or our appraisal of our so-called present day achievements.

The author points out that it is one thing to have power in science and inventions, but it is another thing to use that power correctly. He shows dramatically and vividly how it can be used and how it should be used.

From the technical standpoint, this story is tremendous, and while some of our critics will, as usual, find fault with the hydraulics contained in this story, the fact remains that they are not at all impossible.

This story is published in the *Summer Edition* of

AMAZING STORIES QUARTERLY

now on sale at all newsstands

Ten Days To Live

By **C. J. EUSTACE**

WHEN man tampers with the forces of nature, something is always likely to happen, and most of the time something does happen. Our new author presents an enthralling story of titanic forces let loose by the cunning of man, which almost brought the world to an end.

As yet we know little more than nothing about the titanic forces let loose when we begin to disintegrate matter. We know that every particle of matter contains titanic forces compared to which the highest explosives are nothing more than mere toys.

Some day, these forces will be let loose unless conquered by man. If they are not conquered, we stand a good chance that the world might be blown up, or explode just as certain stars are exploding right along, probably due to some atomic forces.

Today, we handle ordinary matter exactly as savages would handle dynamite. The aborigine will not be harmed by a stick of dynamite. He can play with it, kick it around, hammer it all he wants to, and nothing will happen. The reason is that he has no detonater to explode it, no key to unlock its energy.

The same is true of ordinary matter. The five cent piece in your pocket, an ordinary pebble, a glass of water, all contain forces which are titanic and sufficient to keep the entire machinery of the world running for weeks at a time. But we have not yet found the key with which to unlock this energy.

The present story brings this home to us more vividly, and all we can say is that we sincerely hope that the liberation of energy will never come about in the manner described so realistically by this author.

This story is published in the *Summer Edition* of

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were written the principal events which took place after Rosonoff and I had left. They read, in short:

On the second of April, our two colleagues, M. Alexandre Rosonoff, Paris, and Mr. Clyde Bachus, Haverill, Montana, left our car to procure food for the company. They have not yet returned.

We know now whom to thank—or curse—for our presence upon this planet. Mr. Rosonoff was right when he said there was a traitor on board the *Space-Waif*, and that traitor was the engineer, Benson. Three Ganymedean days after the disappearance of our two colleagues, I, Henry Lloyd, was in the forest hunting, when some one shot at me, but, fortunately for me, missed. Upon returning to the ship, I found neither Lenhardt nor Benson present. I knew that whoever my would-be assassin was, it was some member of the expedition, for we alone had firearms, and we had never found any signs of life save of lower orders. Presently Benson broke through the underbrush and came up beside me.

"Did you get anything, Mr. Lloyd?" said he.

"No, but I nearly got a bullet," said I, watching his face closely.

"What? Did some one shoot at you?" asked he, in apparent surprise.

"Yes," said I, "and I can pretty well guess who it was."

Of course I wasn't sure that he had attempted to shoot me, but I had known Lenhardt long enough to be fairly sure he was above such an act, so only Benson remained—though he had always seemed to be honest and trustworthy.

His eyes narrowed and hate blazed from them.

"So you know it was me?" he asked. "Well, I'm the man who brought us here, too. You sent me up the road for murder when you was still a lawyer in Wisconsin, back in '98. I got out though, and I've waited a long time for a chance to bump you off. I thought I'd be able to clean up the bunch of us by monkeying with the machinery of this thing here, but it didn't peel out. But I'm getting you *now!*"

He reached for his revolver, but then a shot rang out and he fell to the floor. Mr. Lenhardt was in the doorway with his rifle still smoking.

"Close call, Mr. Lloyd," said he.

We buried Benson a little way in the forest and then returned to the flyer, which we managed to right again.

For three months we have waited for Mr. Rosonoff and Mr. Bachus, but as yet they have not returned. To-morrow we are going out to find them, and may God help us in our mission.

Henry Lloyd, Haverill, Mont.

FOR a long time I remained in the space-car, hoping that the next day would bring some sign of my remaining friends, but as no clue of them appeared, I took a rifle and set out to find them.

For three long Ganymedean days I searched in vain, and then, late the last day, when I stood on the top of a high ridge, I came upon a clue. I was standing on the ridge, scanning the surrounding country for some sign of life, when a pinpoint of light struck my eyes. This glimmering point came from the top of a lone tree that stood in the center of a fairly large clearing.

My heart jumped. It must be some sort of artificial reflector, and it must have been a man who placed it on the tree-top.

As fast as I could, I marched through the tangled forest till I came to the clearing of the lone tree. Quickly I clambered up into its branches to the highest twigs that supported my weight, and there I found a mirror—one of the mirrors from the *Space-Waif*—suspended from a branch by a string of leather. Tied to the mirror was a wallet bearing the initials E. L.—Erich Lenhardt. I opened it and pulled out a piece of paper, roughly folded, upon which was scrawled:

"Here they come. Lloyd and I have searched for a month now, for you, Clyde and Rosonoff, and now, on our homeway, we are being attacked by a tribe of savages. I doubt whether they will spare us.

E. Lenhardt."

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a textbook. Moreover, most of the stories are written in a popular vein, making it possible for any one to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge.

1. How would a radium mine affect the miners? (See page 688.)
2. What is the wonder city of Australia, renowned for its beauty? (See page 700.)
3. What do you know about Ganymede and its relation to the Planet Jupiter? (See page 723.)
4. About how long is the year on the Planet Jupiter? (See page 730.)
5. What are the characteristic features of the vulture's eye? (See page 740.)
6. How can an actinic color effect be produced with infra-red rays? (See page 741.)
7. What approach has been made to the appearance and movements of amoeba and how was it done? (See page 748.)
8. Give examples of how matter can be changed in appearance and be restored. (See page 748.)
9. How long does it take for the body to grow cold after death? (See page 748.)
10. What effect has oxygen on the blood? (See page 748.)
11. What proportion of the body's weight does the blood represent? (See page 749.)
12. Could a high tension transmission line affect a high tension telephone line running parallel, but twenty miles away? (See page 754.)

I groaned. It seemed that only misfortune haunted me since our landing upon this strange, inhospitable world.

A search of the surrounding grounds resulted in my finding a rifle, broken and rusty, with a few dark stains remaining on the stock. Close by lay a couple of bronze short swords.

There seemed no hope of my friends' being alive, so I turned wearily back to the *Space-Waif,* which I reached two days later, and for several more days waited to see if Rosonoff would come. But he did not, and so I determined to try to return to Earth.

The next day I looked over the engines, refilled the oxygen tanks and tried the various control levers of the machine. Finally I learned these fairly well and determined to set forth upon the return trip the next day.

And so, the morning of the next Ganymedean day, just as the sun rose over the blue sea, I pulled down the starting lever; again came the slight scraping sensation, and then I rose into the air of Ganymede. At the height of one hundred miles over the moon's surface I increased the projectile's speed more steadily, and at 600 miles I shot again through space at 1,000 miles a second.

Three desolate days passed, when a sudden thought struck me. I had lost all track of time while in the Ja-vas captivity—what if the Earth were now on the other side of the sun?

But I was fortunate in that respect, for upon making some observations through the telescope, I saw the Earth lying before me, a beautiful crescent of green, while a smaller yellow crescent shone on one side.

And the next "evening" I came through the Earth's atmosphere, to stop a hundred feet above a great, moonlit ocean. I kept along at this height, moving eastward, and was overjoyed to find myself presently floating over a country which I correctly judged to be America. Ascending to an altitude of ten miles, I found my way to Haverill, Montana, and located the ranch. I brought down the space-flyer, but due to my inefficiency in handling it, completely wrecked one side of the shed, which formerly housed the machine. The racket brought out the ranch-hands, who at first stared at the great ship as though it were some infernal monster. Then I opened the door, stepped out, and greeted them with a quiet "Hello, boys!"

It is unnecessary for me to describe the scenes which immediately followed my emerging from the *Space-Waif*. The men simply swarmed over me, nearly killed me with kindness, pumped my hand till my whole arm was sore, and demanded what sort of men were in the Moon.

Presently some one discovered that my companions were not with me, and wanted to know where the others were.

"They're dead, boys," I told them, whereupon the company at once became more subdued. I was carried into the house and put to bed as if I were a babe, and I gave myself over to a good sleep. In the days that followed, I told the boys the story as I have given it here. I learned from them that two years had elapsed since we five had started out on that memorable voyage in the *Space-Waif*. To me it seemed an eternity.

I realize full well that this narrative will not be accepted as truth, so I shall give it to the public in the guise of fiction.

But back here, life has held no charms for me—my intimate friends are gone, and Navara's sweet face haunts my dreams ever since that desolate Ganymedean day. Sometimes I wonder if I did not do wrong in going away without absolute proof of her death, but no—she could not have survived that fall over the cliff. She is dead, but my mind does not want to accept this fact—does not want to think that that ethereal face has returned to the dust from which it came.

But there is still Rosonoff—I have no proof of his death, so some day I must, I shall, go back to bring him away, or leave my bones to rest on the same soil that harbors those of the others.

Three years after my leaving, and in case I do not return, the world may read this narrative, and form its own opinions. I doubt if I will ever come back—I want to die in the land that bore the face of the Moon Girl.

After-word

"VERY good, Mr. Bachus," I said the next morning, as I handed the manuscript back to my fellow-guest. "How long have you been in the story-writing business?"

First he stared at me in surprise, then a quiet little smile touched his lips. "I thought you'd believe it first, but I can't blame you for not giving the thing any credulity. I suppose it *does* seem a little far-fetched. But, nevertheless, it's true."

I decided to humor the poor chap, and so agreed that the thing was not outside the pale of possibility. But he told me to visit him sometime and see for myself.

So, a year later, when I was in the vicinity of his home town, I paid Bachus a visit, and then he showed me the *Space-Waif* itself. Still I was incredulous until he set forth upon his return trip to Ganymede, which departure he insisted that I witness.

The last I saw of him, the metal flyer rose vertically out of the shed (which had two great doors in the roof, as explained in his manuscript) then slowly assumed a perpendicular position as it steadily mounted. The ranch-hands and I watched it for some time until it faded into the gloom of the April twilight.

That was three years ago—he has not come back—and so I give you his manuscript and let you form your own opinions as to how much truth there is in this story.

THE END.

THE PSYCHOPHONIC NURSE

By David H. Keller, M.D.

(*Concluded from page 716*)

Teeple finally crawled out of bed and sat in the sunshine. The house was still. One day the nurses were discharged, and his wife brought him his meals on a tray. Soon he was able to walk, and just as soon as he could do so, unobserved by his wife, he visited the nursery. Black Mammy was gone. The baby, on a blanket, was playing contentedly on the floor. Teeple did not disturb her, but went to his wife's study. Her desk was free from papers, the typewriter was in its case and on the table was a copy of Griffith's book on "The Care of the Baby." He was rather puzzled, so he carried his investigations to the kitchen. His wife was there with a clean white apron on, beating eggs for a cake.

She was singing a bye-low-babykin-bye-low song, and to Teeple came a memory of how she used to sing that song before they were married. He had not heard her sing it since. Thinking quickly, he tried to reason out the absence of the nurses and the Black Mammy and the servant-girl, and the empty desk and the closed typewriter, and then it came to him—just what it all meant; so, rather shyly, he called across the kitchen:

"Hullo, Mother!"

She looked at him brightly, even though the tears did glisten in her eyes, as she replied:

"Hullo, Daddy, Dear."

And that was the end of the Psychophonic Nurse.

THE END.

A New Scientifiction Story

The Vanguard of Venus

by Landell Bartlett

This story will not be published in any magazine but we have arranged to give it to our readers in attractive book form—ABSOLUTELY FREE. Turn to page 751 and learn all about this big Free offer. Remember! This is the only way that you will ever be able to read this remarkable tale.

The EYE of the VULTURE

By Walter Kateley

Author of: "The Fourteenth Earth."

ONG before the rest of the surveying party were awake, Megg and I set out to locate the new camping ground. The chief difficulty in selecting a survey camp site on the prairie is in finding a place where water is available. Here on the flat western plains there were no streams of running water, no springs and very few lakes. There was indeed a small lake a few miles to the south of us; but we had been told that the water was so alkaline that it was not fit for man or beast to drink.

Old Thibault, who lived at the bottom of the bluffs where we came up out of the river valley a hundred and thirty miles back, had told us that a small coulee led into the lake from the north; and he imagined that somewhere along this would be the best place for our camp.

We found the coulee to be only a short depression in the otherwise level prairie. At the point where we came upon it, it was only two or three feet below the surroundings. But upon following it down a couple of miles, we found that it became deeper and possessed here and there a trace of a dried-up pond.

We finally chose a place where the sloping sides of the course were five or six feet high; and where, in a sharp bend, there was evidence that water had been standing not many weeks ago.

The place was thickly strewn with bleached buffalo bones, indicating that this had formerly been a favorite watering hole for the denizens of the plains.

I was confident that by sinking a well a few feet at this point, we would find at least a temporary supply of water. And as there were no indications of alkali in the near vicinity, we might reasonably expect it to be fairly free from that poison.

I knew that digging here would be rather a slow and tedious job, because I had learned from previous experience that in such a place the soil would be one tangled mass of buffalo bones in all stages of decay, to a depth of some ten or twelve feet. I hoped we would not have to go much deeper than that to come upon the vein we sought.

Having selected this camp site, we repaired to the slight eminence of a badger mound, and planted a flag on a pole as a signal for the expedition to come on up.

Although it was still early morning we knew they would be watching the horizon with field glasses for the signal. As we finished setting our flag pole, we noticed a mirage beginning to form in the south-east; and very shortly the clear-cut outlines of a town began to appear.

And we saw, apparently only a couple of miles away, the unmistakable replica, (albeit inverted), of a town we had passed through two weeks earlier; according to our calculations, about three hundred miles away.

Megg had never been on the plains before, and to him this was incredible.

He could not believe that we could really see a town so far away.

I assured him that there were instances on record of people having seen several times that far and I related the well-known circumstance of seeing ice in the Mediterranean Sea.

Captain Rose, of the steamship *President Adams*, reported that on a morning in midsummer the passengers and crew saw a large piece of floating ice, accompanied by several smaller ones, floating above the horizon, in the middle of the Mediterranean. These were so clear that they could see the blue and green veins in the ice. Yet at that time of the year there could be no ice nearer than several thousand miles.

It is believed that they saw a reflection of the Arctic Ocean.

As the sun rose higher, the mirage cleared away; and the brown and level prairie land stretched away as far as the eye could reach, with nothing to relieve the monotony except our own tents, ten or a dozen miles away, mere white specks on the boundless expanse of light brown, which is the characteristic color of the half-bleached grass in midsummer on the plains.

The prairie met the sky in a horizon just as straight as a chalk-line, forming a perfect circle at the limit of vision. Then as the sun rose higher, we commenced to see little crinkles in the horizon; and presently little heat waves began to chase each other. They distorted the horizon line into indefinite little wrinkles, as if a number of very much attenuated and transparent worms were hurrying along the hot brim of the world, and making frantic efforts to go fast enough to avoid being burnt.

When the plains are blistering hot, and your eyes follow the heat waves, they all appear to dance with a sort of demoniac rhythm; and you catch yourself thinking with horror that perhaps you are not really seeing this phenomenon in the distance, but that these

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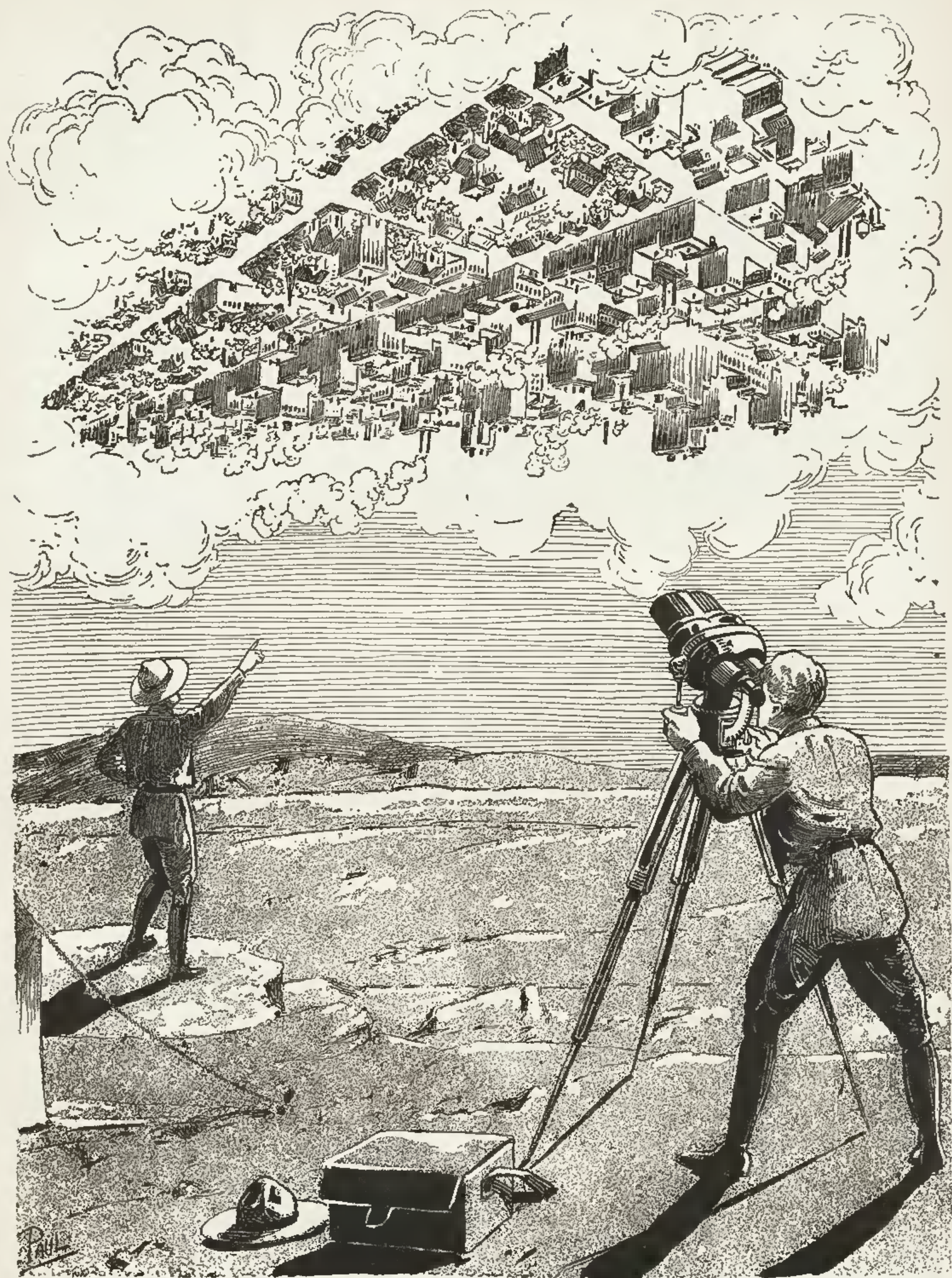
NOT all eyes are alike, as we well know; nor can the human eye be called such a good optical instrument, compared to the eyes of some of the wild animals and birds, and particularly, to those of the wild birds of prey. They have a vastly keener eyesight and can register things at a distance impossible for a human being to even glimpse.

However, there is much in optics that we do not understand today. Our new author, in this story, brings out a number of theories, novel and interesting, if not actually surprising, and his reasoning seems to be founded on solid scientific grounds.

We promise you a pleasant twenty minutes with this story.



Of course, the city was wrong side up, as though it were suspended from the sky, for the image must always be inverted in a mirror.

pulsations are taking place in your own brain; and that the heat is unbalancing your senses. Then you close your eyes to see if you can shut it out. The vision persists a moment and then fades; and you feel reassured.

We had nothing to do but to hobble our horses so they could not run away, and sit down and wait for the others to come up.

WITH our glasses we could see that they were breaking camp; and soon the white blotches gave place to several dark specks which the glasses resolved into teams and wagons, attended by several men on horseback.

And now a cool breeze sprang up, and we lay down on the half-dead grass to rest. For a while we lay at full length and gazed at the clear sky.

Presently a large black bird flew majestically over us, high in the heavens. He appeared to be traveling in an absolutely straight line. "What kind of a bird is that?" asked Megg.

"That's a vulture," I said. "They live off dead animals."

"Yes, I have read about them," he rejoined. "They are really quite wonderful birds, although they are carrion eaters. Naturalists claim that they can locate a dead animal twenty or thirty miles away. Some say they can see it. Others say they can smell it. In any case, it is nothing short of marvelous."

"Yes," I said, remembering an extract from my Natural History. "They have been known to descend from a height at which they were almost invisible, to feed upon a dead snake, only a few inches long."

"I am going to watch this fellow; he acts as if he were going somewhere," and Megg took up the binoculars and followed the unwavering flight for several minutes without further comment. Then he observed: "He is getting pretty small now. I guess he is going clear out of sight. Here, let's see if I can pick him out with your telescope."

I handed him my glass, which he limbered out; after a minute he announced, "Yes, here he is, still going. No, he is turning now."

"He seems to be circling around now," he continued after another moment. "He must see something on the ground. There is another one now. They are both circling. There, they are both circling. There, they are going down. Now I see a couple more coming. Yes, they must have found something."

He closed the telescope, and fell to meditating.

Finally he looked up, saying, "You can't make me believe that fellow didn't know where he was going when he passed here. And there is no knowing how far he had gone before that. I must have followed him for twenty miles. It isn't possible that he could see a dead coyote or badger lying in the grass, twenty miles away. And yet it's just as impossible that he could smell it."

"Funny thing, isn't it?"

"When I get back to take my post-graduate course, I am going to see what the professors have to say about it."

We said nothing more on the subject that day. But during the summer, we saw a great many of the birds; and one day Megg succeeded in shooting two of them.

They were of the turkey buzzard family (Thinogryhus Aura). We dissected one of the eyes as best we could with the very meager equipment at hand, and examined it with a pocket microscope.

We found that this eye conformed in general shape to that of most large birds' eyes. That is, it was not spherical like land animals' eyes, but distinctly elongated from front to back, as though a ball were stretched out to a somewhat ellipsoidal shape. And the crystalline lens, instead of being fairly thin and doubly convex, as in ordinary eyes, was nearly spherical. However, the anterior convexity appeared to be slightly the less pronounced. The iris, pupil and retina revealed nothing of special interest, but the sclerotic casing of the eyeball, usually called the white of the eye, instead of being of fibrous construction, as is usual in most eyes, consisted largely of bone, and was very firm and rigid.

I afterwards learned that all these peculiarities were well-known to ornithologists, and that they were to some extent common to all raptorial birds.

Megg was not very well satisfied with the examination, and determined to try again under more favorable circumstances. He thought that better equipment and a more powerful microscope might bring out details that we had missed.

Accordingly he cut the other bird's head off, and preserved it in a jar of alcohol. And when he went back to college that fall, he took the head with him.

Several years passed, and I saw nothing of Megg, although we exchanged a few letters. I knew he had finished his college work and had become an experimenter in an industrial laboratory conducted by a well-known firm engaged in the manufacture of lenses, telescopes and other optical equipment.

THEN one day I received a letter from him, saying he would like to have me take a trip with him over the plains. He seemed very anxious to have me go, and finished by saying:

"I want to show you what it is the vulture sees."

Of course my curiosity was aroused, and since I was about to take my annual vacation, I wrote him accepting his invitation and making an appointment to meet him and arrange for the proposed trip.

According to arrangement, we proceeded to a little jerkwater station on the edge of the prairie, where we engaged a pair of saddle horses and a light camping outfit, sufficient for a three or four days' journey across the plains. That evening, at the little frontier hotel, Megg explained to me what he thought we were going to see.

"After I went home that fall," he commenced, "I kept on thinking about that vulture's telescopic eye or nose, whichever it was. And during my college work I kept an eye open, to see if I could discover anything that would throw light on the subject. You know I specialized in physics and chemistry.

"Perhaps I may as well indulge in a little lecture on light and vision. I am sure you won't mind even if I

repeat some things about which you already know.

"Indeed, I won't mind."

"Well, then, as you know, there are certain oscillations or vibrations in matter which scientists call waves, for want of a better name. These waves are of different lengths or frequency; and there are certain groups of them that our senses are able to perceive. There is one group that are very short, and we are able to sense them with our eyes, as color. The next group that we are able to sense are very much longer and are known as heat waves. These are ether waves.

"But in between these are a multitude of different lengths that we cannot sense at all with our natural equipment. Nature has not endowed us with any organs that respond to their vibrations.

"Again, after heat, there is another long series of waves, this time in the air usually, as far as we are concerned, that we cannot detect, until finally they become so long that we are able to perceive them as sound.

"The number of the different length of waves is almost infinite, but Nature picks out a little group here and another there, saying in effect, 'Here are these waves. They are enough to get along with, and when you need some more, I will give them to you.'

"Of course we don't know all about these waves, but we are able to measure them in a way; and we have been able to invent scientific apparatus that can sense a great many that were formerly beyond our ken.

"Of the waves we call sound, we have quite definite measurements. They are very long. In music, we have given names to a few of the most important ones, and the human voice is capable of producing them with great exactness. We speak of them as the scale of notes. Some notes represent wavelengths that the voice cannot produce; but we can hear and recognize and even produce them with musical instruments.

"Naturalists have long suspected that there are short sound waves beyond the range of our ears, which insects can both hear and produce; though there is no definite proof that this is the case. Just what Nature uses all the rest of the infinite number of wavelengths for, we do not know. Neither do we know why she has been so stingy in letting us use them.

"However, we do know that waves of different lengths do exist, because we have been able to capture them with, for instance, the X-ray machine and the radio broadcasting machine.

"Well, it finally occurred to me that if Nature had been a little more liberal with the insects, in regard to sound waves, than she had been with us, she might have been a little more liberal with the vultures in regard to light waves.

"I reasoned that the vulture's eyes might have been fashioned to sense one or two more wavelengths than we are permitted, thus giving them one or two more colors.

"In that case, some things that are colorless and so invisible to us, would have color and be visible to them. The more I thought of this, the more plausible it seemed. So I set to work to verify this theory. I took it for granted that these birds could see the same colors we see. The longest waves that affect our eyes are the dark red, .0007621 millimeters; and the shortest are the violet, .0003968 mm. The intermediate ones produce the other colors. But if the bird could see one more color, it seemed probable that it was one immediately beyond one or the other end of our spectrum—either slightly longer than .0007621, or slightly shorter than .0003968.

"After much thought, I decided that the short rays—the ultra-violet—were the most probable, because it is quite generally known that brilliant sunshine is very replete with actinic, or ultra-violet rays.

"I read everything I could find pertaining to eyes and vision; and among other theories, I found one to the effect that chemical changes take place in the retina of the eye, creating photographic images, which are sensed by the optic nerve and transmitted to the brain.

"THESE images are obliterated by an electric current and the sensitizing chemical is renewed very often. The rapidity with which the eye can conceive changes in moving pictures seems to indicate that the change takes place 20 or 30 times in a second.

"There appears to be quite convincing proof that this photography takes place, in the fact often demonstrated, that if a frog's eye is plunged into a solution of alum immediately after death, an image may be found, actually fixed on the retina.

"It seemed very probable, then, that there were certain photographic chemicals in the vulture's eyes that were not in ours, and that they were responsive to sunrays that were either longer or shorter in wavelength than those of our visible spectrum.

"Therefore I took up a careful study of photography, paying particular attention to the effect of light on the various chemicals.

"Early in this investigation, I was impressed with the peculiar reactions of various salts of iron when brought in contact with solar light. One experiment, recorded by Lord Rayleigh, tends to show that when a plate treated with ferro-cyanide of potassium and ferric chloride is exposed to infra-red rays, color effects are produced.

"Ordinarily, the rays in the infra-red region are incapable of showing any color reactions.

"Although, as I say, I suspected that the vulture's enlarged color perception had to do with the other end of the spectrum, the violet end, still I suspected that these chemicals might contain the solution of the secret.

"Accordingly I set to work to make a careful chemical analysis of one of the eyes that I had preserved in spirits; and to my great satisfaction I found very distinct traces of these compounds of iron; whereas tests of other animals' eyes were noticeably lacking in ferrous reaction.

"My tests were later verified by an analytical chemist. I felt then that here, at last, was fairly conclusive proof that there was at least one color visible to the bird, that was outside the range of our perceptions.

"Of course, I had no way of judging what the frequency or length of these waves might be; but since the waves beyond the violet have such well-known powers

of exciting chemical changes, I felt justified in sticking to my first guess, Rayleigh's experiment to the contrary notwithstanding, that they were at the ultra-violet end of the spectrum.

"I was not content to rest here, however. I determined to try to verify my conclusions, and finally set to work to alter certain violet rays, if possible, to make them conform in frequency to the visible violet ones.

"After much unsuccessful effort, I hit upon a plan of arranging a system of reflectors on a roughly rectangular form, endeavoring by trial to space them at such a distance from one another that they would create a wave interference.

"After much careful manipulation, I was able to arrive at a spacing that appeared to make a light red ray seem a little darker, or a violet appear a little nearer the indigo shade. That is, I was able to step each color up a very little toward the red end of the spectrum. I hoped, in this way, to be able to step some of the ultra-violet rays up among the violet ones, thus rendering any substance giving off ultra-violet rays visible.

"To experiment with it, I frequently took this apparatus out into an open field where I could get an abundance of sunlight; and I found that it gave to the vegetation, the soil, and even the blue sky, a slightly different color.

"One day, as I was peering through the instrument, I noticed what I took to be a small column of smoke, ascending from the far end of the field. I thought to myself, 'Somebody must be burning rubbish there.'

"But it occurred to me as being rather strange that, although I had been in the field quite a long time, I had not noticed anyone working in the vicinity; neither had I observed the smoke before.

"I took my eye from the instrument, to search for the person who had made the fire; but I could see no one. Suddenly it dawned on me that I could not even see the smoke. I looked through the instrument again, and could distinctly see the ascending column.

"I now noticed that it was of a distinctly violet color, and not like any smoke I had ever seen before. My next thought was that they must be burning some sort of chemical that was coloring the smoke, or at least giving off colored fumes. But why should they be burning it off in an open field like that?

"I decided to go and investigate. I took one last look through the instrument, to establish the definite location, and setting down the machine, started off across the field.

"I had only walked a few paces when the thought struck me that it was not smoke or fumes from a fire, but some kind of a vaporization that was not visible to the naked eye. Feeling that I was on the verge of an important discovery, I broke into a run, and approached the spot in breathless haste. And there, in a clump of small weeds, I came upon a small, dead poodle dog. The carcass was giving off a very offensive odor.

I DID not linger, but hastened back to my instrument; feeling very jubilant, and convinced that I had discovered the secret of the vulture's eye.

"Since that time I have reduced my instrument to a more compact form. And it is for the purpose of verifying my faith in its performance that I am making this trip.

"This is the machine," he continued, as he took a bulky instrument out of a suitcase. "I have fitted it with some powerful telescopic lenses. I hope to-morrow will be a clear day, so we can test it out."

The next morning we set out at daybreak, and noon found us far out on the level plains. After we had eaten our lunch, we began to watch the sky for vultures.

For a long time we had no success. We were about decided to give up the vigil and move on into a more remote region, when we spied a vulture, away to the west, flying on a line that appeared to be taking him about a mile to the south of us. We got him under focus with the binoculars, and followed his flight for some time after he had passed from the field of vision of the unaided eye. When we felt that we had the direction of his flight well established, my companion set his instrument up on a tripod, and proceeded to adjust it to focus on that portion of the horizon toward which the bird was flying.

At length he announced, "There it is. I have it." He made one or two more minor adjustments and then exclaimed, "Come and take a look! It is plain as day!"

I laid down the glasses, and put my eye to the eye-piece. At first I could see nothing. Then the view gradually cleared, and I saw a thin column of what appeared to be dark smoke, ascending high into the sky; and around its top circled two or three vultures.

"I will venture to say this is the first smell you have ever seen," observed Megg.

"Yes," I said, "you certainly have discovered the secret of the vulture's eye."

We decided to find a watering-place, and camp a couple of days for old-time's sake, as well as to further observe the workings of this device, through the discovery of which we were able to visualize the odor of a dead animal. I say the odor of a dead animal, because that was what we naturally supposed we had just seen. But Megg assured me that other odors were visible, too.

He related how, a few weeks before our trip, he had taken a motor trip into the country in the early morning. He had seen at a distance, through the instrument, what he at first took to be the smoke of a prairie fire, as it was spread over quite a large area. He was unable to see it with the naked eye; but since it appeared to be not far from the highway, he resolved to investigate.

He parked his machine beside the road, planning to walk across the adjoining fields and make an examination. But when he opened the door (he was driving an enclosed car), he was immediately aware of the unmistakable odor of guano coming down on the breeze. Needless to say, he closed his door and drove on. But by this circumstance he was convinced that his instrument would render visible various other odors. In fact, he was inclined to believe that it was not the actual odor, but certain gases given off, carrying the odor, that we saw.

About mid-afternoon, we came to a small spring at the foot of a little hill. Here we made our camp, and settled down for a two days' stay.

An hour or two before sunset, we noticed a vulture circling low over the prairie, only a short distance away, and we immediately turned our instrument on him. We found, as we expected, that he was encircling a thin column of smoky substance arising from the ground.

But now I noticed that the column was of a very beautiful color.

"What color would you call that?" I asked.

"That is a very pronounced violet," my companion replied. "It is really the ultra-violet, which ordinarily is just beyond our range of vision; the instrument is converting the ultra-violet into violet rays.

"It would be impossible to say what it looks like to the bird. It is no doubt a color that we have never seen, and never will see. We wouldn't know what to call it, if we did see it. To describe it would be like trying to describe red, for instance, to a person who had always been absolutely color-blind. It couldn't be done."

"Well, anyway," I replied, it is a beautiful color. It makes me think of some wonderful giant wild-flower, growing out of the landscape."

But Megg was lost in contemplation, and did not answer right away. He was lying on the grass, and I suspected that he would soon fall asleep. I knew he was tired.

SHORTLY he spoke, albeit somewhat drowsily.

"I have no doubt there are infinite numbers of such vari-colored blossoms all over the world. The earth probably is just one vast flower garden for the angels," he concluded; and shortly afterward he was snoring.

I rested awhile, and then made a little camp-fire. I then fried some bacon, and prepared a frugal supper. This ready, I woke Megg, and we ate in the gathering twilight. Then I took my blanket and turned in, leaving Megg to wash the dishes, consisting mainly of two tin cups, and the little frying-pan and coffee-pot.

We were up shortly after daylight the next morning; and we cooked our breakfast in the best of spirits.

The cool crisp atmosphere and the clearness of the skies in the prairie country, always seems to give one a feeling of exhilaration and well-being, which unfortunately disappears in the heat of the day.

When we finished our breakfast, Megg looked searchingly in the direction of the rising sun. "Do you know," he said, "I would give a week's salary to see another mirage like the first one we saw that summer."

"Yes," I said. "I would give two of them, and call it cheap at that."

"Maybe we will see one. This is just the right kind of a morning. There are no clouds, and yesterday was a very hot day.

"Well, here's hoping," he said, as he took up his glasses to search the sky for birds.

I busied myself cleaning my gun; I hoped to shoot a prairie chicken for lunch.

After a few minutes, Megg laid down his glasses and pointed away to the southeast, remarking, "I almost believe there is one forming over there now." Following his gaze, I saw that it was unmistakably the beginning of a mirage. There were the hazy and indistinct colonnades ranging along the horizon, the bottoms apparently depressing the earth slightly, and the tops extending a little way above the horizon line. These columns appeared like long crystals of some translucent substance, some wide, some narrow; all jumbled together, but all standing upright.

Gradually these dissolved, and here and there trees, houses and smoke stacks took their place, while the heretofore straight line of the bottom of the mirage faded out, giving place to the ragged skyline of an inverted industrial city, with a broad sheet of placid water in the background.

"Do you know what city this is?" my companion asked.

"Yes," I said; "it must be that stockyard and packing-house district that we passed last week on the train."

"It looks almost beautiful now that we are so far away we cannot smell it," he said. "Distance lends enchantment to this view. But doesn't it look close by? It looks as if you could run over there in ten minutes."

And indeed it was the nearest-appearing and clearest mirage I have ever seen, and I have spent the better part of my life in the open country. Even the windows, roofs and the ladders on the chimneys were clearly discernible. In the foreground was a low tower, topped with a weathervane representing a horse with mane and tail flying wildly in the wind, as though racing through the air at top speed. For several minutes we stood watching the ever-changing scene in awe-struck silence. I had a feeling that this was one of those rare occasions when Nature deigns to notice its insignificant human souls, and in a spirit of condescension draws aside the curtains and gives us a long to be remembered glimpse of her treasures.

Of course the city was wrong side up, as though it were suspended from the sky, for the image must always be inverted in a mirror.

But when one has gazed fixedly at it for a few moments, the sense of direction seems to fade, and he is no longer conscious of the incongruity of the scene, and all seems natural. The senses seem to readjust themselves, just as when you see the reflection of the sky in a pool. If you gaze steadily for a moment, you forget that you are looking down; you feel as though you were looking directly at the sky.

I WAS the first to come back to earth, so to speak. My thoughts reverted to our glasses, and then to the new instrument.

"Take a look at it through your enchanted visualizer," I said.

"I hadn't thought of that," Megg said, as he hurriedly picked it up; and after making a few rapid adjustments, placed it to his eye.

He gave vent to one drawn-out gasp of astonishment, which sort of trailed off into an expression of deepest admiration. I waited a moment, expecting

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The LIVING TEST TUBE

By Joe Simmons

FIVE, four, three hours. Nearer and nearer the clock in the prison office ticked off the minutes as the warden nervously chewed his cigar and the prisoner in the death cell above paced the floor of his cage for the seconds that lead to dawn and death. Eternity, scarcely three hours away.

In a room below, reporters discussed with loved ones of the murdered man, the possibility of a last minute reprieve, while over in a corner the condemned man's relatives sat silent and tearful. The chaplain talked soothingly, attempting to quiet the prisoner who had finished his last meal. The rope had been tested. Outside the prison a crowd milled about expectantly.

For weeks public opinion and the press, feeling its pulse, had buzzed angrily over the coming execution of this seemingly guilty man. Leonard Giffin, the prisoner, from his cell steadily maintained his innocence of the murder of which he had been tried and convicted. Grilling and the third degree had failed—failed to bring the confession that men of less moral stamina would have given gladly, if only to get rid of their tormenters for a time. Where others would have quailed and shrunk from planned situations that could not be avoided, silence, the simple reiteration of innocence, and then more silence, was all they could force from him.

The use of scopolamine, the inducing of twilight sleep, where a man is under the influence of drugs and his lips answer questions that his will tries to refuse to respond to, had failed to bring the desired confession. The use of the drug was merely an experiment at that time.

THIS is another story that you had better not read before going to bed, unless you crave that particular sort of scientifiction on which the more hardened ones seem to thrive. The theme that our author uses is by no means novel, but in this case it has been treated in a new way, and the science is a great deal better and more elaborate than the science in similar stories that have appeared before; nor will the idea sound so impossible perhaps fifty years hence.

It was common property about the State Capitol at the time of Giffin's arrest, that some one was to be held up as an example, for the present administration had plans for reelection and some brilliant coup must be a platform byword.

From the time he made his first simple statement, the prisoner had gradually become silent and morose. Hope had gone, he felt. Slowly but more tightly, the web of circumstantial evidence was woven to overcome the prisoner's alibi. Circumstances over which he had no control, a clever district attorney, a jury unconsciously tired of pardons and errors, by which criminals escaped unscathed the penalties of the laws of the state; all reacted subconsciously to make more efficacious the pleadings of the prosecutor to give the state a verdict. The extreme penalty! The judge, austere in his majesty, gave his sentence—pronounced the time-worn admonition and benediction ending with "and may God have mercy on your soul."

As court reporter for *The Daily Mirror*, I covered the story thus far: the strangest case of circumstantial evidence ever reported or investigated by me. Of conviction I had been almost certain, but I was shocked at the infliction of the death penalty. In short, Giffin was accused and convicted of a cold-blooded murder, though he claimed he had neither seen nor known the deceased. Robbery, it was said then, was the supposed motive. The pockets of the dead man had been rifled. Giffin claimed he had heard some one cry out as he heard a shot: on turning the corner, he found the body and was only attempting to give aid, when the patrolman saw him bending over the body. There was no revolver found near the body, but a gun on Giffin's person had been fired one time and its calibre matched the bullet which the coroner removed from the brain of the slain man. The deceased's effects were found a short way from the body, where it was supposed they had been thrown hurriedly by Giffin, when he saw the patrolman coming on the run.

Why a young business man of known temperate habits should suddenly become insane enough to attempt robbery was an unsolved mystery. The books of his firm were in excellent condition and his bank balance showed a tidy sum. The testimony brought out at the trial was certainly not enough to warrant giving the death penalty. Yet the date had been set.

Ted Moore, the district attorney, worried himself a great deal as to the condemned man's story and although he had tried the case, set a precedent by asking for a stay of execution, so that he might retrace Giffin's story for himself. This was not granted by the Governor. By many it was considered that Moore was making a grand stand play for reelection, because a petition bearing several thousand names had been presented to the Governor asking for clemency one week before the date of execution.

PUBLIC opinion buzzed incessantly. On the streets, in places of business, in homes, everywhere, there was talk about the guilt or innocence of Giffin. Three days before the time set, Moore jerked me into his office, as I was making daily rounds for my paper, handed me a cigar, waved me to a chair and sat down on his desk in front of me.

"Not for the press, Robert," he began, "but tell me

". . . For nearly two hours the head has been asleep, unconscious of what has been going on around it. In conducting our operation and our hypnotism, I learned much. But a moment now and you shall hear for yourselves."

personally, what do you think of the Giffin case?"

"Well," I returned, "I covered the case from beginning to end and can see no reason except that Giffin is the child of circumstances. I hear that Governor Stafford has refused to even consider clemency."

"All of which is true, Bob, and we haven't forgotten the hundred or so pardons he has issued in the last year. Stays of execution no end, and you have heard whisperings of bribery on signing pardons yourself. I am half inclined to believe them true. Strange that this fellow will not give a stay even for so short a time as I asked, when he has given admitted criminals clemency that he knows they did not deserve."

"Why all the sob stuff, Ted? Is Giffin a personal friend?"

"Justice, Bob, I feel has been tricked again. Foolish? Yes, but the unbiased whisperings of conscience cry, 'Wrong,' and have cried it since the day of sentence. I have worked day and night since to get more time, but to no avail. I have proven to myself that the shell in Giffin's gun did not show fresh powder residue, which means that that cartridge could not have killed Stewart. My error, Bob, for a young lawyer like myself is vain and foolish when attempting to make a name for himself. To such a man every person is guilty until he is proven innocent. Another thing, the microscopic examination of the grooves in the bullet that killed Stewart showed that they did not fit the lands or ridges in Giffin's gun. Lastly, I have proven to my own satisfaction that the bullet that killed the man was not of the same make as that which had been fired in the prisoner's weapon. Giffin's plea that he carried the gun on an empty shell must be correct. Conclusive evidence, Bob, and yet I have failed to get the Governor to grant us a stay of execution. I explained this to him personally, but he seems uninterested," Moore concluded.

"Well," I spoke slowly, "your additional evidence is conclusive enough for me." I extended my hand. "I am with you. If anything is to be done, call on me."

"Thanks, old man. Do you know Dr. Hausen, the scientist?"

"The amateur criminologist, you mean?"

"The same."

"Why yes, and have known him for several years. Why?"

"Nothing, except that this morning I employed Hausen to undertake to find the man who is responsible for the murder. Hausen has his methods, you know. The time is short, but it is the only hope we have."

"You mean that you believe the murderer is free and Giffin had no hand in it?" I asked sharply.

"I do, and hope to prove it before it is too late. Don't smile. I am not spending the State's money for this attempted proof of innocence. It is my own. I am so certain, since my ideas have rearranged themselves, that I am using my own resources to attain an end.

"Hausen started work this morning. He was interested in the case and had followed it from beginning. He has asked us to keep in close touch with him. That is well, for if I am not mistaken, he will give us something definite to work with shortly. I wanted you to know, so you could help us if we need you."

"In what way can I be of service?" I asked.

"Who can tell, Bob? Hausen loves his criminology and its allied sciences like his life and you may be certain that if we are called upon to assist him, it will be in some spectacular manner. The timing and presentation of scenes that he learned as a trouping actor have been of great benefit in staging his climaxes. Hausen has not forgotten his stagecraft. He picks his cases and makes his puppets dance when he pulls the strings. Be ready when I call."

The demand of the populace for clemency had become so strong in the next few hours, that *The Mirror* sent me to the capital to learn what effect the petition had had, and how the Governor stood on the question.

"You may say to the public for me," the Governor said, looking beyond me, "that no further petitions will be received in this office and that no pardon or stay will be granted a man who is, and has undoubtedly been proven, guilty. This maudlin sentiment of the public is all rot. This last is not for the papers. Good evening, gentlemen. I am sorry that my office forbids me to be at the execution."

Innocent—innocent—This word seared itself across my brain as I stood looking at the retreating figure of the Governor—a man who had signed hundreds of pardons since he had come into office, who had stirred up the House of Representatives by their number—pardons, which seemed to the public undeserved, and pardons (it was whispered) bought and paid for like a sack of sugar across the counter. It seemed strange indeed, as I stood there and watched the door close behind him.

"HAUSEN speaking," a voice came over the wire in Moore's office.

"Yes," Ted answered.

"Can you come right over and bring Bob with you?"

"By all means!" Moore hung up and whirled on me. "Get your hat," he said.

In half an hour we came to Hausen's laboratory. It was one of those old buildings of red brick that look older than they are. It was night, shortly after nine. The night of Giffin's execution! Three hours to go!

Through the door came Hausen's voice, "I ask you to stop now and sleep, concentrate on my hand," Hausen's voice went on softly, "sleep, gentle sleep, is coming to soothe and caress, to soothe and caress," the voice died to a monotone and then faded out.

Moore and I looked wonderingly at each other.

The door opened and Hausen stood looking back into the laboratory before he spoke to us. "How is the temperature, Hargett?" We did not catch Hargett's reply.

"Good evening," Hausen opened up the conversation as he drew off a pair of rubber gloves and pitched them into a basin. "I called you, believing that a climax was near. Now I know it is. Since our last meeting three days ago, I have been busy with every detail of this case, and only one detail might possibly

have given Giffin the benefit of the doubt; but it seems that I have not gathered enough evidence, combined with your testimony about this gun, to get a stay of execution. We shall ask for none. Apparently there is a sinister influence at work in the Governor's mind, which will prevent his issuing such an order. However, something has happened to me this evening, that, if put into a story, would be called impossible. Chance and a scientific mind to assist the goddess of chance, have cleared the matter for us.

"Moore, I have a report for you. A death has occurred in my laboratory this afternoon, through no fault of either my assistant or myself. It was caused entirely by the man's state of mind. I shall make out a death certificate later and have my witnesses sign it; but for the present I want you to trust me implicitly."

"You are an older man than I, Hausen," Moore replied, "and your judgment is more mature. Go ahead as you see fit, but unless something is done soon, Giffin's chance for life will be over!"

"We understand each other then," Hausen spoke warmly. "Now let me give you my facts. Mike Farrel," Hausen went on, "a member of your rogues' gallery, came into my laboratory late this afternoon. We—that is, my assistant Dr. Hargett, and myself—were at dinner in the adjoining room. We came upon Farrel attempting to rifle the safe. As he attempted to escape through the window by which he had come, he fell to the pavement below. Death was instantaneous. His neck was broken. The ambulance surgeons will confirm that, as will Dr. Winters, who lives next door. I have sealed their lips for the time being, by saying that I would take care of the body until the coroner makes his inquest. I desired the body, because in his pocket I found a short letter that means a great deal to us. The Governor will be here any minute now; he believes that Farrel is here, not dead, but injured and calling for him."

"The Governor here, to-night?" asked Moore, his eyes sparkling, "we have a chance for a stay if we get him here," he went on. "But," he looked wonderingly at Hausen, "how did you get him to say he would come? Especially to this city and on the night of Giffin's execution!"

"I told him over the telephone that Farrel was delirious and was calling him and had entrusted a package with me for him. You wonder why a Governor comes at the call of this criminal. So did I until a few hours ago."

Brr-brr- A bell on the table rang violently twice.

"The Governor is here now," Hausen spoke. "That bell was the signal agreed upon to be given when the Governor arrived. In the ampitheatre on this floor an audience of scientists have gathered while we were talking. I hope you will pardon me for inviting them, but I know my colleagues will be interested in a demonstration I intend to show them. Both of you keep an eye on the Governor, but don't let him see you. Get a seat behind him and watch every move he makes. But first get word to Giffin that he has a stay. It is not so yet, but I hope to get one before it is too late. Save the poor fellow as much torment as possible. Tell the warden that we will call by eleven fifteen and confirm it." With this, Hausen directed us to the phone, and left us.

THE Governor, shortly after his arrival, was met by Hausen, in a room adjoining the amphitheatre and was told that Farrel had died from the effects of his injury.

"Did he make a statement before he died?" the Governor asked.

"No," Hausen assured him. "Death was instantaneous. He did not have time to utter anything, except to cry out as he fell from the window."

"Too bad," commented the Governor, but he smiled as a look of relief spread over his features, "Farrel felt that I was his one friend. Pardoned him last year, you know. Poor fellow! That just goes to show that once a criminal always a criminal, doesn't it? You say he came here to rob your safe? You said something about a package?"

"Yes," Hausen spoke curtly, "the package was the letter you wrote Farrel, demanding some papers of some kind or other. I found it on his body and thought it best that you have it. Let's not beat about the bush, Governor. You know as well as I know what is in that safe." The Governor's face became tragic.

"How should I know what is in your safe, sir? Do you—" the Governor began.

"You know, Governor, that your reputation hinges on the document reposing in my safe at the present moment. At least you will agree it could cause you great embarrassment. But I feel that it would best serve the interest of the people of this state if you sent in your resignation instead of having to go to trial. As for exposing you, rest assured that I shall not do so myself, as there is not enough evidence to secure a conviction."

Relaxation spread over the drawn features of the Governor as he extended his hand to Hausen. But Hausen ignored it and started speaking again.

"Sir, since you are here and find that the man you came to speak with is dead, and, since those papers the safe holds are of no further use to me, I wonder if you would thank me for turning them over to you? All right, you shall have them, but not until I have finished the scientific experiment waiting for me in the ampitheatre in the next room—a new discovery that will probably interest you. Several of my fellow scientists, whom you know, are in the audience and have been waiting impatiently for me to begin. If you care to wait until I have finished—"

Most assuredly the Governor would wait.

We were all there at last. The room seemed stiflingly hot. Manning, the eminent scientist, and the Governor were chatting and smiling. Carson, the chemist, Bartholomew, the expert on radium and X-rays, Haywood, astronomer, Steward, physiologist, Hausen, several other men at the top of their various scientific branches, whom I did not know personally, and Moore and myself made up the crowd.

The ampitheatre, a large room built up with tier upon tier of benches on various levels, led down to a pit

at its center. The pit was bare of apparatus except for a large table in its center, on which something was covered with a black velvet cloth. Numerous bottles and jars surrounded the table all but hidden by the cloth, while to the side supported by a bracket was a tangled array of wires on a switchboard, a small generator, some storage batteries, a series of radio tubes, and a few rheostats and various freak coils. The tubes were glowing and a glass pump below the table worked with slow strokes, drawing in a blue solution one side of its piston and sending out red on the other.

"Gentlemen, be seated," Hausen spoke as if directing a play. "I must beg pardon for the high temperature of the room, but it is necessary for the success of the experiment. You have gathered here as my guests to witness another of those experiments, of which I am justly proud, and in which I had the capable assistance of Dr. Hargett."

HAUSEN'S eyes wandered from face to face as he warmed to his subject. "The experiment we propose for this evening is one which even a layman can comprehend. If you will bear with me, my friends, I shall attempt to explain, in simple language, the workings of the experiment. For five years Hargett and myself have been experimenting with shed blood and its effect on living tissues. For three years we have kept a dog's heart alive, although the rest of the body has long since returned to dust. Five months ago we decided to delve deeper into those experiments of which we had just scratched the surface.

"We experimented with rabbits, guinea pigs, and pigeons at first, then sheep, dogs, monkeys and finally we have come to the greatest test of all—a human being. We have named this test "A LIVING TEST TUBE," for it is alive and yet to all intents and purposes is about to begin the long road into the land of decay."

"It has been the dream of scientists for ages to produce life. Yet in our theories we find it impossible, as it is contrary to the fundamental laws of nature and the universe, to produce life artificially. I'll grant you that motions like those made by amoeba have been noted by the addition of a dye to a mixture of olive oil, gasoline and water; but we have proven that it is only the effect of surface tension we have there. We have no life that feels pain or requires food. Matter may be neither created nor destroyed. Rather paradoxical, you say. Certainly! When matter is used it only goes into another form and is used again. The simple rusting of iron by the action of the elements is one simple form of this change; there is no waste there. The change from ice to water to steam is another more simple example. What is the difference then if we keep a thing for a while in the original form nature intended it to have, and keep it so even after death?

"Ancient Egypt preserved her kings in a marvelous way, so marvelous, in fact, that we are enabled today, by exploration and microscope, to find out how and why they died. Yet mummies are mere parchment.

"Through tests we have been able to keep a sheep's stomach alive for days after the rest of the body has been dismembered. A chicken liver has been kept in our laboratory for a year and has shown that it was alive by constant growth—so constant, in fact, that it has had to be trimmed occasionally to keep it normal in size. It is only right that you look startled and ask the questions, how and why?

"To begin with, you must remember that the body is made up of various kinds of cells, of which the brain cells are the most specialized. All cells constantly burn out and are undergoing repair even in your own bodies at the present time. The brain cells being the most specialized are the ones most susceptible to decay. They are wasting and being replaced constantly as the being gets older, as he thinks, works, and acts. Sleep is necessary to restore the worn-out cells.

"It takes such a short time for the brain cells to start decaying that in twelve minutes after the death of a human being, they have already begun their journey into decay and a step toward a different form of matter has already been made.

"Thus our problem was, after death had been positively ascertained in the specimen before you, to get it prepared by doing all the necessary operations within the limits of twelve minutes. It may seem like lightning to you to realize that Dr. Hargett and myself prepared the specimen under the cover there in that length of time, but we did. Fortunately, we had instruments laid out for one more experiment on the lower animal before asking the Governor for the body of some executed criminal for the test—provided the criminal agreed to it."

The Governor turned slightly pale at this direct mention of the death that was to take place within the hour. He looked at his watch and then back at Hausen.

Hausen went on, "To forward our test, we have learned to declot the blood; a little of the original mixture is unclotted. Three minutes is the normal clotting time of normal human blood, yet the body does not grow cold immediately; it takes from six to eight minutes for the warmth to leave it in a state of *mortis rigor*."

"THE most important thing in the body, next to the brain," he continued, "is the heart. A glass pump below the table, you will note, has taken that vital organ's place, pushing one way and pulling the other seventy-two times a minute. That, you know, is the normal heart beat of man. The blood, as it runs from the head through those glass tubes there, you will note, is clarified from its dark bluish color by the addition of oxygen, which is contained in the tank there. A small amount is added to it just as the valve in our pump opens to pump it to the head again. I need not try to explain what change takes place in this blood by the addition of this element, except to say that the carbon dioxide or waste matter is thrown off and new life given it by the oxygen. Various other waste is thrown off at the same time, chief among them being carbonic acid; but our problem at this time is the food for the brain.

"In severing the neck from the torso, care was taken not to injure the lymph glands, for it is from these

glands that we are obtaining the food for the blood for the duration of the experiment. Were we to do away with these glands, in a short time our live tissues would shrink and die. Lymph, as you have been taught, is the food of the blood.

"The blood receives, as I have said before, our greatest consideration, for the blood makes up about one-thirteenth of the body's weight. In this case the body's weight was one hundred and fifty-two pounds, so we are using eleven pounds of blood with the addition of a pound of normal salt solution, which is salt water of .09 per cent. We were forced to do this as part of the blood was lost in our dissection and we are attempting to copy nature. This expedient was not absolutely necessary, however, for we now have only a part of the body to supply with blood, where once we had it all. If we had left the blood for more than twelve minutes, clotting would have taken place in all of it and ruined the experiment, as salt water alone does not act as blood, and cannot carry oxygen to the tissues, so as to eliminate waste substances. To overcome this as soon as we started the experiment, hirudin, a substance obtained by making an extract from the glands in the head of the leech, was mixed with this blood to prevent coagulation. We used peptone once, but found it not as positive in its action as hirudin.

"The glass heart and tubes leading to and from it are coated with a thin oil which also tends to prevent clotting of the blood that flows through them. These glass containers are heated to 98.5 or normal body temperature. The room seems warm and close. This is because we have the room heated to body temperature, which we find is best for these tests. How do we keep the blood uncontaminated? I agree that the blood is a wonderful medium for bacteria, but we have accomplished the prevention of this multiplication of bacterial life in this test by a relatively simple device—a device which we hope can be used to purify the blood of patients suffering from certain diseases. But I will discuss this process of sterilizing and purifying the blood at some future time, as it would take too long here.

"You wonder, I see by your faces, how long we will maintain life. Only so long as the blood is capable of utilizing oxygen, and only so long as our electrical 'nerves' continue to throw out their stimulations.

"These 'nerves,' made of fine platinum wire, are connected from our machine on the left here to the endings of the real nerves in the head. The current which passes through the nerves is almost infinitesimal, yet it is controlled simply and positively by the series of step-down transformers and even goes lower after it has passed through the vacuum tubes here. Its flow is regulated by the rheostats. The important point here is that we are using a very small amount of current on a wavelength higher than was thought possible. All nerves have an electrical significance as impulses run their length carrying and dispatching messages from the body to the brain and vice versa. They contain in life a minute amount of current; although until now, the gold leaf and other tests would not prove it. Yet the existence of body auras have been claimed by some; perhaps some of you have tried experiments to find out their nature!

"I have tried to describe to you the workings of the automaton," Hausen went on. "They constitute an experiment never before attempted by science for any purpose, let alone for the purpose I have in mind.

"UNDER this small cover we have the head of a man who was killed this afternoon by a fall from a window of this laboratory. That it was an accident I can prove. I can also give positive proof that he was dead after the fall. You have my word, the word of Dr. Hargett, of the ambulance doctor, and of another doctor whom you all know and who is here this evening. Dr. Winters, will you give your opinion?"

"I will, sir," Dr. Winters spoke up. "The man was quite dead."

"Then," said Hausen, "it only remained to get permission to perform a post mortem examination, which we did—with additions. The law requires an examination of this kind on executed criminals, why not on those criminals accidentally killed?

"I can now safely let you see the specimen," Hausen said as he gently drew back the cover and revealed the head of Mike Farrel! The head stood upright on the table. The neck came through a hole in its top and the back of the head rested in a padding of bandages. The eyes were closed, but there was no pallor on the face. The cheeks were flushed red as in life. The glass heart and generator worked steadily on. My own heart bounded away with itself and the room seemed more suffocating than ever.

The Governor was glued to his chair, his eyes staring from their sockets. He was struck dumb. Terrified. The men of science looked wonderingly at Hausen and then honored him with applause.

"Good God, Bob, what's Hausen up to now?" Moore grasped my arm.

"I don't know," I said, still looking at the head.

"I have saved the most important thing for the last, gentlemen," Hausen broke the silence after the applause had died down, and he looked straight into the Governor's eyes. "By the addition of a bellows attached to the bronchial tubes accentuated by a motor, a capacity of air is forced against the glottis. With this device, which is so controlled that it holds or gives up the air at an electrical impulse from the brain, *our head speaks!*"

The Governor had not gained control of himself. He sat silent, terrified.

"Have you ever seen hypnotism, Governor?" Hausen directed his question pointedly.

The Governor answered, "Yes," by nodding his head violently.

"Well," Hausen went on, "the subject is under an hypnotic spell. I have explained how sleep restores the burnt-out brain cells and how badly it is needed for tissue repair. For nearly two hours the head has been asleep, unconscious of what has been going on around it. In conducting our operation and our hypnotism, I learned much. But a moment now and you shall hear for yourself," and he waved his hand with gentle mo-

tions before the closed eyes of the head. The eyes opened and looked about the room as if not sure which way to focus themselves. Suddenly they were drawn toward the Governor, who was white and shaken. His eyes were staring from their sockets and it seemed as if he must die of fright.

"EVENING, Governor," the voice from the grave spoke. Its words were not very clear but intelligible. "Excuse my appearance this way to-night, but it was an accident that I fell out that damned winder. I don't remember nuthin' more till Hausen fixed me up this way. What time is it now? What! Only an hour till Giffin goes to the gallows, eh? Well, Governor, me and you is goin' to make that hour funny, ain't we, Governor? It wasn't no accident that I come here late today to git some papers you knew I had lost and Hausen had got hold of. Them very papers I had got off Stewart's body after I shot him. But tell 'em, Gov', tell 'em why he was shot. Tell 'em who it was who sent me out to kill Stewart. You, Gov', it was. Because he had proof enough in them papers he had on him, with what he knew about you and could prove, to send you to the penitentiary yourself and that would have ruined his Excellency's good little reputation." The head's eyes roved to the audience. "He let me out of the pen and give me a parole and promised me a pardon if I would get the job done. I killed Stewart and then got to thinking, that if I gave the Governor them papers, he would have me under his thumb and get me hanged if he wanted to. I know him and so I kept 'em myself. Oh, he threatened, but he knew I had the goods on him, and if he squealed he would git himself in as bad as me. So we wus fifty-fifty. He had the pardon and I had the papers. At least I thought I had 'em but I lost 'em and Hausen got 'em—God knows where. I come here to-night to get 'em out of his safe, for I knew I was lost without 'em. The Governor wrote me a letter demandin' 'em and that was the letter Hausen told me he found in my pocket. He come in just as I was about to git the can opened and spoiled the works."

The eyes turned to the Governor again. "You, Governor, is the murderer, not me. I just pulled the trigger. You planned it. Stewart knew too much about you and your pardon-and-run system. Cower, damn you, as you made me cower when you had me under your thumb. You can't touch me now. But you will kill Giffin if you don't git a move on!"

The Governor could not say a word now. His mind was gone. He could hear but not speak.

"Sign this!" Hausen shoved a pen into the Governor's hand and he signed the pardon with trembling fingers.

The Governor moved slowly toward the balcony. A broken old man now. Moore started up to stop him, but Hausen shook his head. "There is no means of escape from there," he said quietly, as the Governor passed out the door.

Farrel's eyes followed him.

"Hausen," Moore said. "Is this a trick? How can you make a jury believe that this dead half alive head knows what it is talking about? How do we know they will accept such a fairy tale? No sane jury will believe such a thing as this could possibly hap—" Boom! A shot echoed from the balcony. The audience rose to its feet as a man. Someone rushed quickly out on the balcony and then stopped in the doorway abruptly, bewildered.

"The Governor—" someone gasped, "the Governor has killed himself!"

"There is your proof," Farrel's head replied. And in the confusion that followed, Hausen threw the nerve switch that broke the contact.

THE END.

SOME PUZZLING QUESTIONS

Editor, AMAZING STORIES:

I have just finished reading the April number, and noticed one thing which may be said of all your publications of AMAZING STORIES, and that is the well-balanced selection of stories in each number. A great many of your readers, as I noticed in "Discussions" column, praise according to their individual tastes. Personally, I like all the stories, and also like the way in which the various stories are assembled under one cover.

Like many of your readers, I also have read your publication since its first appearance on the book-stalls, and have *never* missed a copy. Your methods of making the magazine bigger and better are very acceptable.

There are various degrees of excellence in what you give us, but for some reason, I cannot state, "The Green Splotches" and "The Thought Machine" have interested me unusually. I have read each of them at least six times. Another type of story which I favor is one in which the reader is left in some doubt at the end of the narrative, and may find a solution in his own mind to his own satisfaction. An example of this type of story is, I believe, "The Color Out of Space" and "The People of the Pit," both excellent.

Regarding illustrations in your magazine, I favor one full page picture to each story, taken from an interesting situation. In the serials, one picture to each installment.

Now as to the stories with gruesome plots, which many of your readers also seem to be in doubt about; by all means let us have them if they are worthy of perusal, and not a cheap endeavor to capture interest.

There are several questions which I would like to ask you, problems which I and my business associates have stumbled against in our luncheon discussions. Here they are: Do light rays, sound waves and various energy rays have to overcome inertia?

Has the theory of light diverging from the straight path been accepted by all International Scientists?

Is there serious consideration of the theory that time is a curved entity and if so could you give me an explanation of this theory?

Suppose I construct a rigid square frame of steel or some other suitable material, and in each corner I place a first quality mirror facing the one diagonally opposite. Now if light travels at approximately 186,000 miles per second for an indefinite period, as we are taught, then I should get light reflected for an indefinite period if a light is introduced into that frame. On a flat reflecting surface, we are also told, the angle of incidence of light is always equal to the angle of reflection.

There must be a fallacy to my argument, but I don't know where. Could you tell me?

Another question: could a high tension trans-

(*Continued on page 754*)

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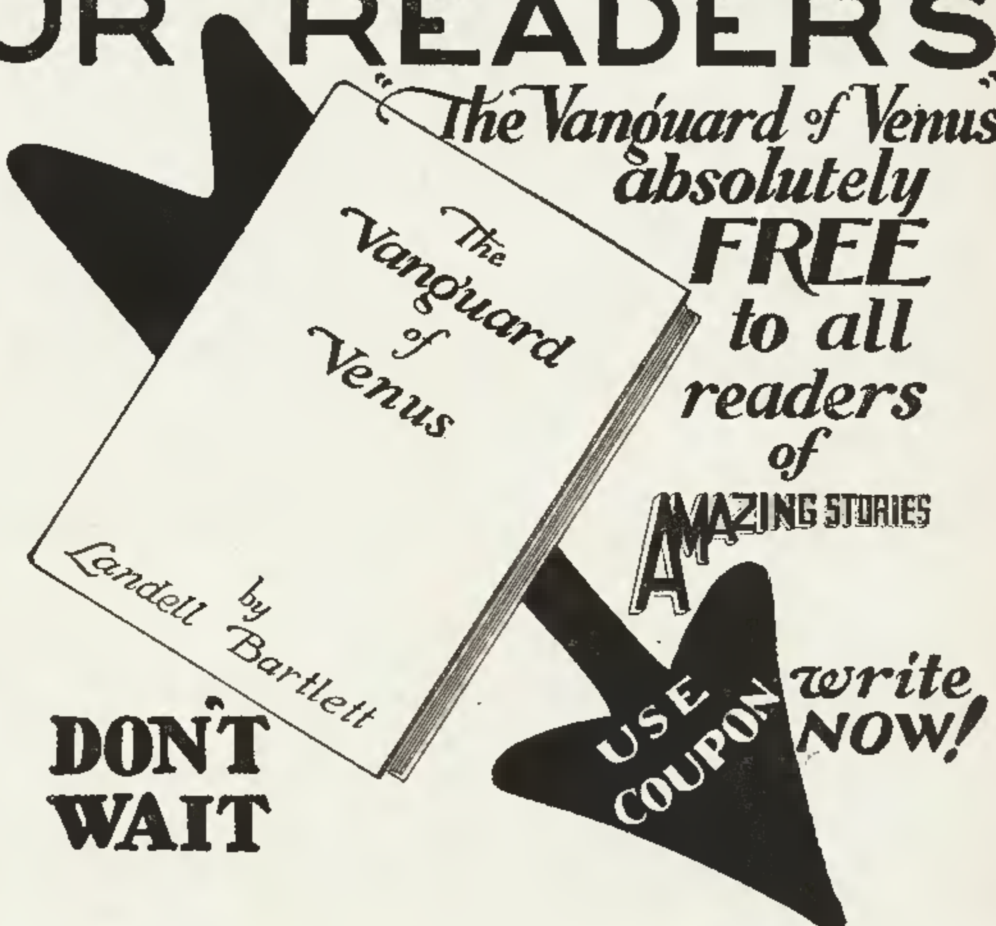

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A. S. 11

THE EYE OF THE VULTURE

By Walter Kateley

(*Concluded from page* 743)

some explanation. But he said nothing more; he only stood gazing like one hypnotized, without moving a muscle.

Finally I said, "Pardon me, but do you see something?" Slowly and with apparent reluctance, he removed the instrument from his eyes, and handed it to me.

I directed it toward the mirage, and applied my eye to the lens.

Whether I gave any exclamation or not, I do not know; but I shall never forget the beauty of the sight that met my gaze at that moment.

There was the city, just where it had appeared a moment before; but rising from a thousand places was a beautiful violet exhalation. In some places it rolled in billowing volumes; in others, it rose in thin columns; as smoke rises from a small chimney on a still evening. Again it was only a thin vapor, which did not conceal, but mantled all with its veil of soft color.

Gathering from all its various sources, it united in a vast and transcendentally beautiful cloud, which drifted away over the lake, illuminated and glorified by the light of the rising sun.

The golden rays of our great luminary, mingling with the deep violet of the exhalation, resulted in a multitude of the most wonderful hues and colors.

Here and there a light breeze caught up a colorful wisp, and resolved it into a compact and fanciful figure; or else scattered it, or wove it into beautiful lace-like patterns that dissolved almost as soon as they had formed. It was indeed a marvelously glorious scene.

And now my eye fell on the weather-vane horse in a seemingly wild dash up out of a beautiful billowing cloud. I was so enchanted with the celestial beauty of the scene, that I almost expected to see him drag Elisha in his fiery chariot out of this Elysian turmoil and away to the skies. Then a brisk breeze caught the cloud, causing it to envelop the weather-vane, and then tore it into long wisps or tongues, which, illuminated by the level rays of the sun, looked like half-subdued flames. One could almost fancy the city was on fire.

But time was precious, for a mirage often lasts only a few moments, so after a short survey, I restored the instrument to Megg, who took it eagerly.

But even as he raised it to his eyes, I perceived that the scene was fading.

Almost as rapidly as a breeze blows a wisp of mist from a mountain-side, it was gone.

With one accord we sat down heavily on the grass. We were fatigued by the stress and excitement of the extraordinary experience. We gazed blankly at the encircling vastness. There seemed to be nothing to say.

At length Megg pulled himself together; and his face lit up with a smile.

"Think what a joy my 'Smelloscope' would have been to Nero!" he said. "He could have experienced all the thrills of a burning city every day, while he retained them intact."

THE END.

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Complete Instructions For Building a Television Receiver

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Of course, Television is far from perfected. It is still in a most elementary stage. There is little use in trying to gloss over the truth. But a start has been made and it remains for the "fans" to do their share, as in radio, in helping to develop the new art.

In the last issue of TELEVISION there are full instructions from which you ambitious enthusiasts can construct an efficient experimental set. With this set you will be able to receive some of the Television programs now being broadcast. Experimenting will continually improve reception. Get your copy of this new issue today! Start to work on your Televisor tonight! Be the first in your neighborhood to have a Television set. The old "fan days" are here again. Don't miss the fun!

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Another question: Could a high-tension transmission line affect a high tension telephone line running parallel, but twenty miles away? I have been assured that it was affected, my informer being an actual witness, he states.

Before I ring off I must say that the little scientific talks in the front of your magazine are very enjoyable, and I would like to see them every month, discussing the latest scientific features and discoveries, as in the past.

This letter is rather bulky, I admit, but I would like to see at least part of it in "Discussions," my questions and answers preferably.

Norman H. Moore,
1676 Third Avenue W.,
Vancouver, B. C., Canada.

(We would blush if we appended any comment to your letter, it is so laudatory of our efforts. We seem to have met your desires pretty closely. Now as regards your questions: Light waves and sound waves represent energy. Sound can be made to drive machines, of course, in a purely experimental way; and light is presumed to exercise an absolute pressure, so that the sun is pushing the earth when it shines upon it. Einstein is the authority for the diverging of light from the straight path, but Einstein's theory is not accepted universally, and the same applies to time being a curved entity; this again is Einstein's. The only way to get an answer to your question is to study Einstein and then you will probably have trouble. As regards the reflection of light from multiple mirrors, we have to consider that it does travel the 186,000 miles every second, giving an incomprehensible number of reflections. It is almost an impossibility for the action of a high tension line to affect a telephone line twenty miles away, for the telephone system is not sensitive to anything near the degree of sensitiveness of radio.—Editor.)

GOOD WISHES AND A KINDLY CRITICISM FROM A LADY

Editor, Amazing Stories:

I do not see many letters from women in the "Discussions," so I thought we ought to let you know that a few of us are among "those present."

I have read your magazine since its first issue. I always read "Discussions" first. I get many a good laugh from some of them. Some do not realize how they expose the immensity of their ego.

The story that appealed to me most was *The Visitation. The Treasures of Tantalus* was very entertaining and exciting. In *The War of the Worlds*, the description of the people leaving England was very realistic. I like Wells, and have read nearly everything he has written, including political articles.

You have given us so many good stories that it is hard to make a list. I like stories of other worlds, and fourth dimensional stories. Wells' *Men Like Gods* ought to be in your magazine. I thought it the best he ever wrote, and would like to read it again.

I can never hope to attain the heights of knowledge that some of your readers seem to possess, as I only went to sixth grade in school. But—I don't believe any of them get more real enjoyment and knowledge from your magazine than I do.

In the March issue, the story by Jules Verne contains the words airship, hangar, garage, automobile, turbines, twin-screw and many other words that were not even "coined" at the time he wrote. Can you please explain this? "In *Ten Million Miles Sunward*, the only thing I see wrong is: if the tides slow up the motion of the earth, the comet would slow the motion in a much greater degree. Even though the earth were closer to the sun, our days would be longer and it would take longer for the earth to travel around the sun, thereby making the years longer instead of shorter.

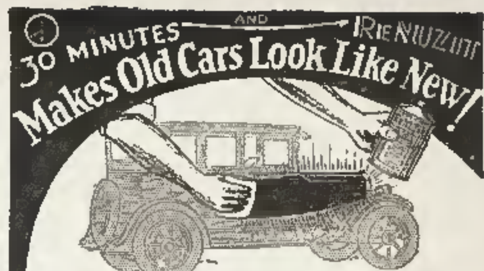
I pass all my magazines on, but never give two to the same person. I am trying to "boost" the circulation so that we can have more than five or six stories to an issue. When they want another copy they have to buy it. That's how selfishness often hides behind charity. But it isn't all selfishness. I would really like to see more people enjoying your magazine. I suppose some day I will regret having given them away, as I always like to reread a good story; and you printed so many that were really fine.

Mrs. Emma Ploner,
3334 W. Madison St.,
Chicago, Ill.

[We think that the discussion columns of our paper, giving the views of so many readers and presenting such varied notions of criticisms of our stories, are most interesting. It is curious to see how differently the same story by the same author affects different readers. H. G. Wells is the one that gets most definitely opposite opinions from readers. The Jules Verne stories are translations of the author's works as he wrote them, and *The Master of the World* is one of his last efforts. This will explain the use of rather modern words.

We have given an astronomer's view of *Ten Million Miles Sunward*.

It is most gratifying to feel that our readers canvass for us. As far as rereading stories is concerned, a really good story will stand several perusals.—EDITOR.]



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From "The Pit and the Pendulum."

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THE FOURTH DIMENSION AND THE POSSIBILITY OF OTHER DIMENSIONS DISCUSSED

Editor, Amazing Stories:

The question of the Fourth Dimension is creating some discussion in your correspondence column. My reading of Amazing Stories is confined to two recent issues thus far. The explanation of that problematical phenomenon given in "Fourth Dimensional Robberies" does not quite satisfy me, but it will pass for lack of a better one. The idea of the mysterious extra dimension is not new to me, but the conception of mechanical contrivances which will operate under such problematical conditions certainly is. A new department of fiction is thus thrown wide open.

For a long time past, stories involving as yet unrealized scientific feats have been appearing in the magazines implying a plausible air of accomplishment. Of these interplanetary travel takes the lead. There is nothing about which I would be more skeptical than the asserted possibilities of terrestrial inhabitants migrating to any other adjoining planet. Furthermore, if one of these was ever reached in safety, the probability of a return journey is even more remote. The principal difficulties to overcome are the physical conditions in transit so that human viability would continue possible, and functional capacity be retained. As a physician I would doubt that. Also any kind of aircraft or rocket projectile would require great speeds under guidance to catch up with and make a safe landing on the Moon or Mars. This would require to be somewhere about two thousand miles an hour. Such would be the problem, for missing the earth on a return journey would be serious. Moving eighteen miles a second, our planet is covering space at sixty thousand miles per hour, so that chasing it after missing it would be poor satisfaction even with the aid of gravity. Thus I must consider the recently announced intentions of attempting such a trip as a phase of suicidal mania.

Another story I have just read, "The Blue Dimension," is also attracting interest. It is more plausible because of the parallel phase of the Fourth Dimension. As I am a believer in the reality of that dimension, I would not scout the assertion of other dimensions as impossible or unworthy of speculation. As yet anything beyond the demonstrable three dimensions of cubic space is purely a speculative problem. Anyone committed to the metaphysical limitations of materialism will reject the Fourth Dimension as unworthy of consideration. But I am not a materialist. I have looked into this problem of dimensions for a considerable time, and can see some accessory functions of space which three dimensions do not cover or satisfy. The discussion of time as a reality does not signify, but the denial of time by your correspondent is not exactly correct. Properly, time is the measurable interval between two experiences which may be registered by consciousness or by the ticks of a watch or otherwise. The sum of these is recorded on a dial, and the total covers a history of a period short or long in which numerous occurrences transpire. Time will have no appreciable meaning to a Supreme Being, for the pendulum of the Universe's clock—Eternity—swings in aeons only. Space also has much the same limitation. Whether measured in inches or light years, it is a human conception in which multiple units of measurement play the chief part. The co-ordinates of three intersecting rectangular diameters will identify any location and function of substances for size at least, no matter what the geometrical figure may be.

This is not so easy, however, when we attempt to measure the Universe at the uttermost limits definable by astronomy. The sum total of all conceivable Space must be Infinity. That is true even if the Universe is limitable, which is not yet proved. At infinity it is presumed with correctness that a circle becomes, so far as human consciousness can see it, a straight line. By what geometrical figure can we then represent the Universe? After trying out the spheroid, cube, and every other form of enclosed space, we will find ourselves baffled. Three dimensions will not hold it when we face the absurdities created by using a measuring stick for infinity. It allows of no multiples or additions, and therefore permits the assumption of a Fourth Dimension to satisfy the unsolved equation of Space.

Coming down to visible limits there are many considerations of dimension, not visible to the senses. Taking an empty box of one cubic foot size, it contains, we certainly know, that much air, possibly freely mixed with other gases, and atmospheric dust. There is also probably evenly distributed exactly one cubic foot of the universal pabulum, ether. Were the gases exhausted by a vacuum pump, there would remain the ether. If

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will still be there if the box is filled with water or liquid lead. Try as we will, there will always be two dimensions of equal size inside one. They co-exist, for few scientists will have the hardihood to deny the reality of Ether in Space. It is the only real thing there is, and therefore owns a set of dimensions of its own.

Being a believer in Almighty God, a Spirit-World, and the human soul, I see no place for these within the scope of the physical three dimensions. They belong to the Fourth or possibly a Fifth Dimension containing elements of "spiritual substance," a term borrowed from Swedenborg. On the score of the things now invisible to the human senses, but still within the three-dimensional plane, how much more remains unseen just outside that limit, rather correctly inside and co-existent, but not demonstrable by any means yet devised.

Assuredly speculation along that line is an interesting pastime. The outlook for "Scientifiction" is promising in various directions. I do not see the future as pictured by H. G. Wells nor any others of the post-prandial prophets. It will certainly be an intensive life, but not necessarily so purely mechanical. I have rather exceeded the limits of the correspondence sheet and will now ring off. On the whole, AMAZING STORIES is far preferable to the average current fiction magazine with their preposterous repetition of modern round-table stuff. A real flight of fancy gives one a greater thrill, for the average modern short fiction makes me tired.

R. MUIR JOHNSTONE, M.D.,
Sask., Canada.

(This letter is so well thought out and so nicely put, that it does not seem to require comment from us. It speaks for itself in excellent style. Dimensions beyond the third are best looked upon as hypothetical and mathematical conceptions. The difficulties which the fourth dimension presents appear when we try to make it apply to everyday matters. We never could find that there was any satisfaction in the construction or drawing of the fourth dimension solid, the "tessaract," so-called. Yet several books have been written on this subject, all attempting to introduce the fourth dimension into everyday life and everyday mathematics. It was said that there were only twelve people in the world who could understand Einstein's theories; perhaps some of these twelve might manage to elucidate the fourth dimension to "the man in the street."—EDITOR.)

MORE ABOUT H. G. WELLS

Editor, AMAZING STORIES:

I have been a pretty constant reader of AMAZING STORIES ever since its inception, but not until very recently have I paid any attention to the discussions department. I now find that this department contains as much interesting reading matter as any of the stories in the magazine (and the stories contain plenty). I don't know whether or not my letter will receive space in the discussions department, but, as there has been a great deal of opinion voiced about H. G. Wells' stories, I would like to give my views on this subject.

Frankly, I do not like Wells' stories. That is, I like the subject matter of them but I think they are too stiff in style and seem to the reader too unreal. What I mean by this is that Wells' stories probably contain more scientific fact and are more probable than the majority, but when one is reading them he has the impression that he is in a dream. Wells' stories, I think, lack what you might call human interest. They read like a description or a catalogue of parts or events. The idea I am trying to convey can be better grasped by comparing Wells' stories with the two stories *The Lost World* and *The Moon Pool* which appeared in AMAZING STORIES. I think these two tales are among the most charming and interesting I have ever read. *Treasures of Tantalus* is of this sort, also. In these stories the author has the knack of making you feel as though you were right on the spot and going through the adventures with the characters. I do not think this is so in Wells. When I read him I always feel as though I am walking around in a trance. I would like to see more stories by authors like Burroughs, Verrill, etc.

The illustrations, as they are, suit me, although I notice that sometimes the captions under them give the whole point of the story away. This can easily be seen by reference to *The Master Key*, where the caption tells that the character used an electro-magnet to shoot the bolts on the doors (which was the whole point of the story). I also think the covers could be a little more conservative in keeping with the high class standard of the magazine.

HERBERT L. SHEPARD,
900 F Street, N. W., Washington, D. C.

[You are going to get many stories in the future by your favorite authors. The covers which you criticize, have been greatly admired and favorably commented on by many of our correspondents so we cannot but feel that they at least "draw the crowd."—EDITOR.]

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AN ADMIRER OF "RALPH 124C41+." CRITICISM OF THE THEORIES IN "THE MOON OF DOOM"

Editor, AMAZING STORIES:

First of all, I want to urge the readers to get a copy of "Ralph 124C41," for it is one of the best scientifiction stories I have read. I am sure they have seen it advertised in your magazine.

A few words about the "Moon of Doom." When speaking of the effects of the tides upon gravity, Mr. Bell did not state the theory clearly; one would think that the tides directly affect the gravitational pull of one body on another. But such is not the case. The tides of the earth merely affect the speed of its rotation. If there were no tides, it would follow that the earth ceased to rotate upon its axis, and the earth and moon revolved around each other, the earth always keeping the same side toward the moon in the same way that the moon keeps the same side toward the earth at the present time. When the earth and moon revolve around each other in this way, they will gradually approach each other until a collision occurs and they form one body. (I have based all of my statements on an article by Sir Oliver Lodge, which appeared in the *New York Times* for March 4, 1928.) This leaves out of consideration the action of the sun.

Now if this theory is true, what did Mr. Bell mean when he said: "The pull of the earth has already counteracted the push of the tides?" When I first read this statement, I thought that Mr. Bell meant that the tides contained so much gravitational force that they could literally push or pull the moon from its orbit. Of course, I could not understand how such a statement could be true. However, after reading Prof. Lodge's article, I found that the tides affected the rotation of the earth, and that the speed of the earth's rotation affected its gravitational pull upon the moon, but that the tides themselves did not directly exert any pull at all.

Although the theory of Sir Oliver Lodge and that of Mr. Bell are directly opposite in meaning, the principle is the same. Mr. Bell says that when the moon approaches the earth, the earth will rotate faster, while Sir Oliver Lodge says that after the earth has *ceased* to turn upon its axis, the moon will approach the earth.

Mr. Bell made another little mistake when he spoke of the days and nights becoming shorter. He said that the sun rose three minutes late; in reality, the sun would have risen three minutes early.

Why should the ato-plane fall when it struck an air pocket traveling from the moon to the earth? It would not fall downward or rather to one side, as Mr. Bell said, but it would fall back if it were within the gravitational pull of the moon or forward if in the pull of the earth.

I wonder if the editor can tell me from which of Poe's poems Mr. Bell's quotation is taken.

In reprinting from the works of the scientifiction writers of several years ago, there is one (I mean one of the best) whom you have entirely overlooked—Morgan Robertson, who wrote some of the best scientifiction I have ever read. "Beyond the Spectrum," written twenty-five or thirty years ago, was one of the first and most original stories to be written about the "Death Ray."

The title, "Absolute Zero," tells you the theme of this story, as does "From the Darkness and the Depths."

"The Last Battleship" is perhaps the best of the lot, although "Fifty Fathoms Down" contains the most science.

Nearly all of Morgan Robertson's stories are about the sea; perhaps some of the readers remember "Masters of Men," which was filmed. He has written many stories of telepathy and hypnotism, such as "Over the Border," "The Magnetized Man," etc. He has also written many humorous stories of the scientifiction type, namely, "A Chemical Comedy," "The Subconscious Finnegan," and "The Brain of the Battleship." He has written many others just as good as these I have named, so I hope I will see some of his stories in AMAZING STORIES sometime in the future.

Now I do hope the readers will not criticize "When the Sleeper Awakes," as they did "The War of the Worlds." It has always been one of my favorites, so I was very glad to see that you were going to publish it. When you (the critics) start on "The Sleeper Awakes," please, please remember that it was written thirty years ago. Also, those of you who are rabid scientifiction readers like myself, please don't criticize Wells too much for plagiarizing from "Caesar's Column." What if he did? They are both wonderful books, so let's let them pass for what they are.

By the way, one of the readers wanted some information about "The Conquest of Mars." It is in eight volumes and, by advertising, he should be able to procure it for ten or fifteen dollars.

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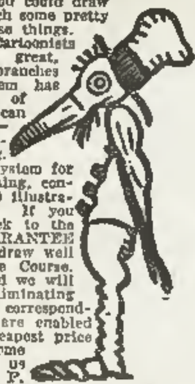

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(Mr. Bell's quotation which you ask us about is from Edgar Allan Poe's famous poem "The Bells." The tides being drawn up by the gravitation exercised by the moon and the sun, may correctly be said to exercise gravitational force. But in a general way we would say this, that in the "Moon of Doom" the theory is stated in fairly good fullness, and your comparison of it with Sir Oliver Lodge's theory, both involving, you say, the same principle, is quite interesting. We shall keep Morgan Robertson's works in mind. We are familiar with them and may find some adapted to our pages.—EDITOR.)

THOSE COVERS OF OURS!

Editor, AMAZING STORIES:

I am not impelled to comment at any length upon the stories contained in your magazine, for they impress me with their satisfying quality to such an extent as to practically exclude any other impression. I find them clever, highly entertaining and instructive—a boon to a mind jaded with concentration and care.

But, now here's the rub. I want to join others in the criticisms of title and cover. I note that you claim that the majority are not only satisfied but also pleased pink in this regard, so I suppose I ought to assume that further comment is futile. Despite this, however, I feel that it ought to be argued that the readers already won over who know and seek the substance of your authors, surely would not desert merely because you refine the tone of the magazine, while on the other hand it would be justifiable to assume that many new readers would be gained by so doing. You seem to find it impossible to believe that one could be so sensitive as to tear off the covers to uphold their pride. Can you not recognize the right to possess an aesthetic sense! I always tear off the cover of my copy, for I feel sure that to exhibit it would be a detriment to my prestige among my friends. Non-readers are necessarily superficial judges, and surely a gaudy, poster-like cover is not conducive to lend dignity to scientifiction. Then, too, the title AMAZING STORIES may be "pat," but must also be unhappy, inasmuch as it can so easily be associated with "Snappy Stories," "Breezy Stories," "Creepy Stories," etc.

But this harangue must needs be presumptious for your mind seems to be made up, even though for reasons that must, apparently, remain a mystery to us outsiders, for it must be claimed that you have disclosed no reason one can grant as sound or sufficient.

Kindly extend my sincere sympathy to Marcley W. Felton, F3/c, U. S. Naval Training School, Hampton Roads, Va., and tell him that he may cry on my shoulder if he lets me cry on his.

Baldwin, N. Y.
HAROLD F. OSBORN.

(We have given a good deal of thought to letters similar to the above, but so far we have not been convinced by them.

We wish to agree fully with what our correspondent says, and have no fault to find with it. The fact remains, however, that the gaudy covers do sell the magazine, and that is the most important thing that any publisher considers. The publishers are fully convinced of the fact that the covers are not artistic or ethical, but this does not affect them in their decision at all, for the simple reason that experience has taught that only "flashy" covers are easily seen when displayed on newsstands.

The next time you step up to a newsstand on which are displayed 150 or more magazines, all of which are fighting to be seen, make this test: Step ten feet away from the newsstand and scan the magazines rapidly for not more than three seconds. The idea of this test is to see which magazine impresses you most. You will find that only the magazines with flashy and loud colors will attract you at all, and that is a good test for these reasons: You walk by a newsstand, and at best, you have no intention to buy a magazine. Your attention will be focused for not more than three seconds. If one or two magazines don't flash into your consciousness and make you stop, that newsstand, from a publication standpoint, has been lost, and you move on. If, on the other hand, you do stop, and at least look upon one cover, then that magazine has struck you—has done its duty, *even if you don't buy it. We could write quite an "amazing story"* about this very subject, but the fact remains that in the magazine business, as everywhere else, it is a fight for the survival of the fittest. It will be found that the magazines with the quietest covers are usually the poorest sellers.

National magazines like the *Saturday Evening Post, Liberty,* and many others, all make an attempt at a good color "splash" or "flash," as it is called in publication circles, in order to be seen well, but, of course, a magazine forty or fifty years old need not go to the extremes of a younger

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A section in which the latest developments of television are reviewed each month. This comparatively new industry is fast gaining popularity. It opens a new field for experimenting to our friend, the "fan."

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A humorous page of misprints contributed by our readers. For each one published $1.00 will be paid, provided that the actual article in which the misprint occurs is enclosed with a few humorous words from the reader.

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In this section all apparatus awarded the RADIO NEWS LABORATORY CERTIFICATE OF MERIT in the month past, is listed, and a technical description given of its purpose and characteristics.

I WANT TO KNOW

This department is conducted by Mr. C. W. Palmer. Its purpose is to answer the difficulties of our readers. The value in which the "fans" hold this section can be better realized when one considers that there are over 5,000 letters received from readers each month. Naturally only the more important ones are printed in RADIO NEWS.

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magazine which wishes to achieve prominence in a comparatively short time.

If AMAZING STORIES had a circulation of one million copies and was twenty-five years old, it would be simple to adopt a more ethical cover. Right now, that is impossible. Another main reason is that instinctively, the newsdealer will put in the front rack the magazine that has the best "flash," and that stands out, because he knows that even if not every passerby purchases it, at least enough curiosity seekers will step to the newsstand and buy something, and all readers probably will agree, that AMAZING STORIES arouses a good deal of interest by its so-called outlandish covers.

But quite apart from this, we venture to say that most of the readers who are dissatisfied with the loud covers, were themselves originally attracted to AMAZING STORIES by these same covers. And we have on file thousands of letters from readers admitting that they were attracted o the magazine by its cover. And so far, the policy must be right, because the circulation is increasing month by month, with a satisfactory growth, and the publishers are convinced that this growth could not be effected by printing a so-called ethical cover.

Purely as an experiment, we tried an ethical cover on our September issue, which is the Scientifiction emblem, and may be called a rather tame cover as covers on AMAZING STORIES go; but we know right now, that we will lose circulation on that issue. It will take us about three months, beginning August 6th, to know the final results, but we will report them to our readers.

Outside of this, may we call the attention of the few disgruntled ones to the fact that a study of our covers will reveal that at least they carry the idea of scientifiction better than anything else we know of? We try to make every cover as full of scientifiction as possible, and while we may not always succeed, we believe that most of the time we do.—EDITOR.)

AN UNSIGNED LETTER

Editor, AMAZING STORIES:

In writing this letter I have two definite objects in mind. The first is in appreciation for what AMAZING STORIES have accomplished for me, and the second is a request. Let me tell you about the first.

About two and a half years ago I was working in a mill—an ordinary mill-hand, with no prospects in life whatever. It was at this time that I chanced to see a copy of AMAZING STORIES on a newsstand. It happened to be the first issue, I believe it came out with the April number of that year. I read the magazine from cover to cover, and then put the question to myself. Why couldn't I learn something about science? To make a long story short, I saved my money and when fall came I entered a well-known scientific college. I have been a student there ever since, and with the coming September I start the third year's work there. And that isn't all, because when I finish there, I plan to study medicine.

I haven't missed a single copy of AMAZING STORIES; in fact, I haven't lost a copy. I have them all on file since the first issue.

Of late I've been rather busy and haven't had much time to read AMAZING STORIES, but wouldn't miss my monthly copy for anything, as I am firmly convinced that had it not been for its splendid work I would still be working in a mill.

Believe me, I'm a life member as far as the magazine is concerned. To its influence I owe everything that I'll ever accomplish.

Now for the request that I mentioned at the beginning of this letter: When I was a youngster I used to read stories by "Noname." These stories were about the adventures of Frank Reade, Jr., and I certainly enjoyed them a lot.

Now the request is, will you give us some reprints on these stories by "Noname?" I say 'We,' because I feel sure that other readers who have read stories by this author will be glad to see the stories in print again.

Until I make myself a name in science, I'll just sign off as,

B. N., Boston, Mass.

(We are glad to feel that we helped you on your way. We have one advice to give you, cultivate the habit of reading and studying and keep away from trash. We have for a long time had in mind the reprinting of some of the old "Noname" stories, and have a collection in our rooms. You will probably notice that we have given some reproductions of his curious automobiles and things which seem to foretell the progress of the present day.—EDITOR.)

THE CRUELTY OF SOME CRITICISMS

Editor, AMAZING STORIES:

I read your magazine with interest and appreciate its ability to fill a literary cavity which, for a long time needed filling. There is yet room for improvement along almost every line of endeavor but I am sure there are few beneficial alterations possible in AMAZING STORIES.

I have read with avidity the discussions in the magazine and have, until now, quelled the desire to comment concernnig the criticism of certain stories which did not have a common appeal. I realize that criticism to a certain extent is a necessity and yet there is, I am sure, no need for such cutting frankness as is incorporated in many of them.

Being a writer of humorous drivel, that is published without credit to me, I am not subject to such storms of opinion. Yet, I realize also, the subtle cruelty of those comments. Those brain children are the result of labor—real, hard labor—and someone is bound to read them and be pleased or the Editors would never have bought them.

Scientifiction is the result of research and study and we are not qualified to find any fault unless we have indulged in a greater amount of study and diligent research than has the author.

If there is a story which you do not appreciate, there is nothing which will compel you to read it. You need not break into both ends of an egg to see if it is of ancient vintage.

I sincerely hope that your correspondents will be able to see this thing as I see it and be less abrupt in offering their own personal opinions in such a pointed manner. Criticism of certain styles and types is of great help to the average author but I wish to again tell such critics that it hurts to have someone read you and then tell you that you are rotten. I am not saying "do not criticize," but please moderate and say the same thing with a little more tact.

HARRY A. BARNES,
"The redhead humorist"
40 Oak St., Battle Creek, Mich.

(Your comment on an author whose work is attacked by the critics is quite interesting, although it sometimes seems that an author should be hardened to unfavorable opinions of the public, as he certainly has plenty of practice in receiving them, unless he is more fortunate than most.

We want, however, the personal opinions of our readers and we welcome what are called "brickbats" and will try to be humble enough not to let them hurt too much. Your letter, however, is certainly "A Fable for Critics."—EDITOR.)

A LETTER FROM ENGLAND

Editor, AMAZING STORIES:

I have read about ten copies of AMAZING STORIES and I have no hesitation in stating that it is the most interesting magazine that has been published. Of course, Wells is a familiar author with me, but I have enjoyed reading his stories for the second time. His story of the prehistoric age was interesting, but hardly "amazing." As regards the other stories, I enjoyed them all, with the exception of "Hicks' Inventions with a Kick." These stories I considered as absolutely without interest and not a bit amazing or amusing. They reminded me of the old Keystone, pie throwing comedies, and bored me just as much. "The Moon Pool" was a jolly fine yarn, and of the shorter stories, "The Green Splotches" takes precedence. There is no doubt but that, compared with AMAZING STORIES, other magazines are very slow and I cannot get interested in them. I wonder why it is that so very little of your other publications is seen in this country. I have never seen a copy of SCIENCE AND INVENTION here. I have answered one or two of the advertisements in AMAZING STORIES, but I think your advertisers must "jib" at the distance, as they did not reply to my letters.

Would any of your readers care to write to me? I should be obliged if you would put me in touch with any reader who would correspond with me, on any subject. If any of them care to make a friend in England, just a line and I will only be too pleased to answer. Just before I close, I would like to put in a complimentary word for the yarn "Below the Infra-Red." It was just fine. You can rest assured that your magazine is well read and well distributed.

ARTHUR WELLWARD,
25 Alma St., Green's Park, Manchester, England.

(Our Manchester correspondent seems to fail to realize that "Mr. Hicks," whom he disapproves of, puts considerable science into funny stories going under his name.

We are now going on the principle of publishing the addresses of our correspondent. If anybody wishes to have an English correspondent, Mr. Wellward's address is here, and he invites correspondence.—EDITOR.)

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VARIOUS SUGGESTIONS FOR THE EDITOR

Editor, AMAZING STORIES:

In one of the recent issues of the AMAZING STORIES, a critic requested that the "Discussions" columns be published in larger print. I was greatly surprised when the response declared that only a limited space was allowed for the columns. Surely in a magazine having such a wide circulation as this has, it would seem that the company would go to a little trouble to better satisfy its readers. It is indeed hard for one to read that print.

Another thing: a question in the "Votes of Preference" asks whether the reader is satisfied with the present illustrations. I, for one, am not wholly satisfied. In many cases when reading AMAZING STORIES, the reader sees the large illustration at the beginning of a story, and sits on pins and needles till he reaches the event which the picture illustrates. In this way many other events are hardly noticed. I would suggest that each important and interesting action in the story should have an illustration. By means of these pictures the reader could see every move in the event besides reading it.

Now to center on the stories.

It is doubtless a bore to you to receive countless criticisms on one story published issues before, so I pass over all but a few important ones.

The first one I mention is Edgar Rice Burroughs' "The Master Mind of Mars" in the ANNUAL AMAZING STORIES. It is improbable that any author will equal this story. It is a great masterpiece, written by a master mind. I hope that Edgar Rice Burroughs will continue to give his stories to AMAZING STORIES.

The March issue also contained a wonderful story, "Ten Million Miles Sunward." How a man can work out such an impossible and truly "amazing story" is beyond me. I look forward to many more such stories and yet if such are published, I can assure you that I will become a raving maniac without the aid of Lakh-Dal, Destroyer of Souls. The latter is a thrilling, blood freezing tale, but I didn't think so before I read it. I disregarded the accompanying warning and read the story before I retired. Believe me when I say I'll heed every other such warning.

The last request I would like to make is for you to try to have the stories published in simpler form. I do not happen to be a scientist and it is very hard to understand the terms the authors apply to conditions or apparatus which, most likely could be expressed in a simpler manner.

HENRY GOLDMAN,
98 Longwood Avenue, New York, N. Y.

(We have had serious thoughts about using larger type for the "Discussions" columns, as this section of the magazine has acquired so much interest and importance. What you say next is quite interesting. We believe that some authors, perhaps most authors of fiction, would feel that they were doing good work, if they could keep their readers on pins and needles. We would like very well to give more illustrations but we feel that the greater point is to give more text. Your last statement about the difficulties of understanding scientific terms in our magazine will receive our fullest consideration. We believe, however, that it will not be easy to make our stories simpler than they are and to still give them the scientific bias.—EDITOR.)

HICKS' INVENTION VINDICATED

Editor, AMAZING STORIES:

In reference to the story of Hicks' Perambulating Home which appeared in the July issue of AMAZING STORIES, I am sending you a clipping from the Rochester Evening Journal, which may prove of interest to you.

HAROLD COHEN,
23 Catherine St., Rochester, N. Y.

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(Recently, in an illustrated paper, a comic picture was given of a whole party being deluged because the heat of the weather had opened the automatic sprinklers. This also was reminiscent of our inventive friend.—EDITOR.)

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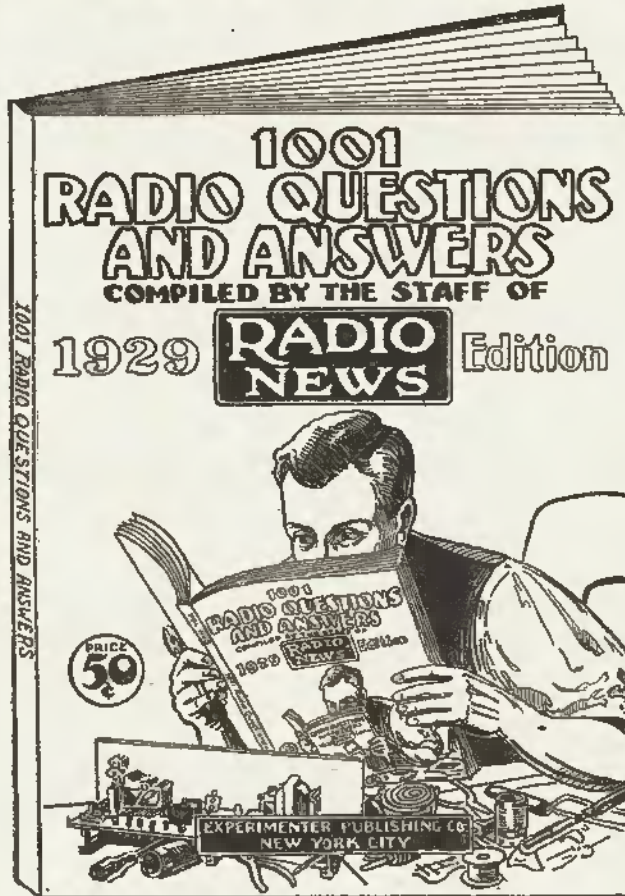

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THE NAME "AMAZING STORIES"

Editor, AMAZING STORIES:

I get a great deal of enjoyment out of the letters of the readers, and must say you people have a lot of patience with them.

Personally, I can't see a darn thing wrong with the magazine, except the name. The name puts it in a class with magazines called "Ghost Stories," "Weird Tales," "Detective Stories," "Wild West Stories" and the rest of that trash.

I agree with you that Paul's drawings are very clever, and I don't dislike the garish covers, but the word "Scientifiction" is much more in keeping with the sort of thing you print.

I saw the magazine on the various racks all over the country long before I ever thought of buying one. I loathe the sort of fiction suggested by the titles given above, and I never took the time to really study the pictures on the cover, for the name was enough.

However, one night I was marooned in a little town (I've forgotten where now) and in my traveling I had read every blamed magazine offered in that particular town's only drug store. That is, every magazine but one, and that one was AMAZING STORIES. I didn't even consider it, and was about to walk away, when the vision of a long lonesome evening made me decide that anything to read was better than nothing.

I enjoyed the magazine thoroughly, and intended to remember to look for it the next month. I believe that it was some two months later, when I happened to remember the magazine, and promptly went in search of it, only to be told that it hadn't sold very well, and had been taken off the market. Believing this, I bought something else, and temporarily forgot all about it.

It was sometime later—anyway I know I had come to Mobile, Alabama in my wanderings—when I just accidentally saw a wild looking cover peeping out from behind some other magazines. I pulled it out and was tickled to death to see that it was the magazine I had enjoyed so much. The fact that it was two months old, and soiled didn't dim my pleasure a bit. I tried everywhere to get the succeeding issue, and finally contented myself with the current issue.

Needless to say I have been a constant reader ever since. I have not subscribed for the simple reason that I have moved about so much I would only be in a constant fear that I wouldn't get my magazine.

What is bothering me now, is this: Is it possible for me to procure the back numbers? I loaned several of my numbers to "friends," including the three issues containing "The Moon Pool." These numbers I want more than any others, for that story has made a lasting impression on me and I feel that in losing the story I have lost something precious. I have the August 1927 issue, then have lost the September and October numbers through "friends," but beginning with November, I have every one, and just let any so-called friend try to get them away from me. When I loan them now, I have chains on them. And now every one laughs at me, over the way I guard my books. In fact they get so disgusted with me, they go out and buy their own copies, which is just what I want them to do. For I want this magazine to go on and on. And if readers will do it, I'm sure going to do my bit to get converts.

I am managing a little restaurant on the edge of the city, and have everyone working there reading AMAZING STORIES, so that those who come in wonder what it is all about, and pretty soon they are doing it too. A frequent remark is jabbed at me like this, "Darn you and your magazines, you've got me too interested in them now, I can't half attend to my work." But it is all said with a good natured smile, so I know that they are willing prisoners.

But going back to my first criticism, I have the "Divil's own time" to convince them that I'm not reading trash. That I learn something out of every story which I read seems truly "Amazing," and unless I nail my company and talk to them like a salesman on his first commission, I only get the merry Ha! Ha!

So for the "luv-a-Mike," give us poor pioneers a break and put the word "Scientifiction" on the front, so that when we sit on a street car reading our dearest fiction, we will arouse the admiration of our fellow men, and make them realize that ours is a superior mentality not interested in so called trashy stories. A hidden magazine doesn't advertise you, and I always fold the cover back when I am reading where I can't get on a platform and vindicate myself. I am honestly ashamed of the name and what it implies.

But as to stories, print whatever you can and will, for I am grateful for even the so called poor ones. *But don't give up the magazine.*

MADLYNE A. RIEGEL,
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(The trouble with the name of AMAZING STORIES as far as changing it is concerned is that expressed in another comment published here. We now have a very large number of readers; enough to populate a fair sized city.

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All people with a fondness for books have a wish to lend good ones to friends, but the result of that is often very sad. For like loaned umbrellas, loaned books are apt not to come back. You need not fear that we will give up the magazine; it has so many readers.

We publish all sorts of comment making no attempt to avoid giving unfavorable criticisms, and the only reason that our discussion columns read so much in our favor is that our readers are affected in that way. It is rather interesting to learn from your letter that what you call a wild-looking cover is what attracted your attention to the long looked for AMAZING STORIES.—EDITOR.)

THE IDEAL OF PERFECTION AND THE SURVIVAL OF THE FITTEST

Editor, AMAZING STORIES:

Both yourself and Super-Critic C. P. Townsend have somewhat misunderstood my letter.

Of course the survival of the fittest is the fundamental basis of animal existence; but I referred to the highest types of evolution, and to them the law of selfishness no longer applies, otherwise there would be no chivalry or protection of the weak, no saving of women and children first in a catastrophe, and what we call Honor and Virtue would not be considered admirable qualities, but signs of weakness.

Followed to a logical conclusion, if there were no higher standards than individual self-interest, crimes would become virtues, organized society would disappear, and anarchy would rule supreme.

Sacrifice and service may not characterize humanity in general, but it is the ideal towards which we are striving, and I have enough experience of life to have seen some examples of it.

I did not write in the expectation of receiving answers to my questions, but only to stimulate the thinking and imaginative processes of your readers, and I may say to Mr. Townsend that I get more satisfaction out of Camille Flammarion's "The Unknown" and L. W. Roger's "Dreams and Premonitions" than I get out of Dr. Walsh's "Psychology of Dreams."

I am somewhat gratified to notice that the writer of "The Moon of Doom" in AMAZING STORIES WINTER QUARTERLY has made Professor Burke exemplify the ideal of sacrifice, by giving his own life to save his friends.

Let me ask another question from the standpoint of evolution: Why does not a Genius produce a Super-genius? Why are the children of various types of Genius mediocre?

J. A. NETLAND,
Oakland, Cal.

(Your letter is very interesting. There is, of course, a great deal more than the rigid survival of the fittest in the processes of animal life on this world; as to why the children of geniuses are not geniuses themselves, an adequate answer is hard to give, but you will find that a great deal has been written on this subject. Camille Flammarion is perhaps almost too imaginative but as we have seen, imagination is a very important thing in the development of our knowledge of natural science.—EDITOR.)

A YOUNG STUDENT OF ASTRONOMY WHOM "AMAZING STORIES" HELPED

Editor, AMAZING STORIES:

Ever since I was nine years old (I am seventeen now) there was something lacking in my everyday life that I could not get used to; there was something needed and I did not know what it was until one day, while passing a newsstand, the prominent cover of your last October number caught my eye. Story of stories! "Around the Universe" was truly the most wonderful story I had ever read.

Immediately after reading it I knew what was troubling my peace of mind. It was the science of Astronomy that I craved knowledge of and I got it in elementary form from "Around the Universe." Since then I have made great headway in this science and am saving my money to purchase a telescope. I have now got a yearly subscription for your magazine and enjoy it very much.

These are the stories that were the most pleasing to me: "The Colour Out of Space," "Around the

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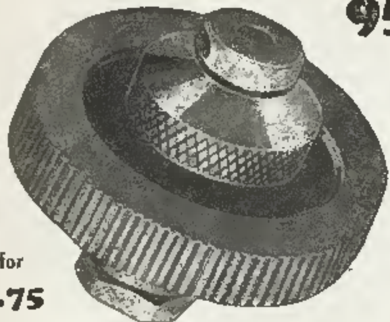

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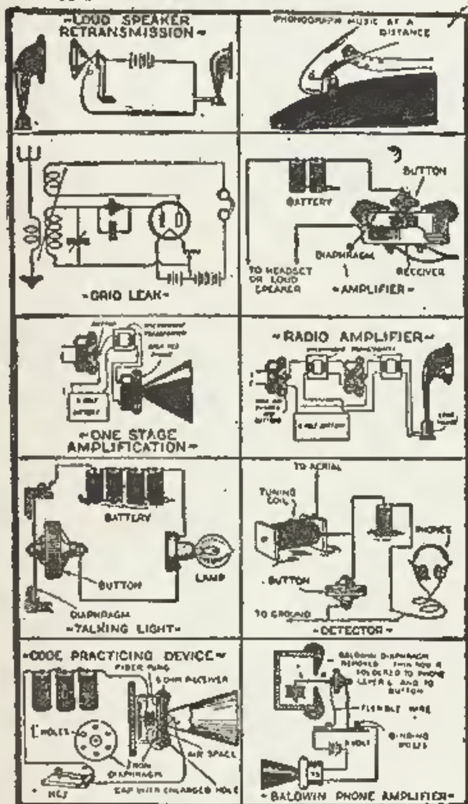

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J. M. WALKER,
205 Lenore St., Winnipeg, Man. Canada.

(You will make the best possible use of our stories if you will let them introduce you to any line of study which will please you, such as astronomy. We would be very glad to feel that our work has operated to introduce such readers as you to the world of natural science.—EDITOR.)

SOME NOTES ON GEOLOGIC CHRONOLOGY

Editor, AMAZING STORIES:

Allow me to comment on "The Ancient Horror," that appeared in the April number of AMAZING STORIES.

The writer stated that the saurians roamed the earth during the Mesozoic era, some five hundred millions of years ago.

Pirsson and Schuchert of Yale state that the Archeozoic era began about 500,000,000 years ago. This would make the Mesozoic occur about 85,000,000 miles ago.

Pages 105-106 in textbook by aforenamed men.

Even with the Archeozoic beginning 1,000,000,000 years ago the Mesozoic would only be some 200,000,000 years ago.

The Sauropoda were land and not water reptiles of the sort described. Pages 481-485.

Another shot. I have lived on a farm nearly all my life and never saw a cow go into a lake or river if there was any other possible place to go to.

References are from, "A Text-Book of Geology, Part 1, Physical Geology."

Written by Louis Pirsson and Charles Schuchert.

Published by John Wiley & Sons, Inc., N. Y.

G. R. BRACKLEY,
Waterville, Me.

(Geologic ages are absolutely speculative. The science of geology and mineralogy is charged with speculation. The old dispute between the igneous and aqueous schools of geology give a good illustration of how much uncertainty has been felt about that science.

If you have never seen a cow stand in a river or pond in hot weather on your farm, the query is suggested as to whether there was a pond or a river on your farm and, if so, were they not fenced in?—EDITOR.)

ANTS IN THE FIRE EXTINGUISHING DEPARTMENT

Editor, AMAZING STORIES:

Enclosed you will find a clipping that may be of interest to readers of "The Master Ants."

The pictures by Paul are excellent.

The stories by H. G. Wells are the very best in the magazine.

Please give us more of H. G. Wells and Jules Verne.

CHARLES LAWRENCE,
1117 West Kalamazoo, Lansing, Michigan.

(We thank our correspondent for the clipping he has sent us; it certainly is very interesting in view of the various stories of ant life which we have published. Our correspondent, we are told, is a high school student, and it is a positive gratification to us to get so much criticism from our younger readers. It is comparatively easy to write books for grown people, but it is very difficult to write for the young, as what will please the young is a great triumph. We can cite Lewis Carrol's two books about the charming "Alice," and Milne's book "When We Were Very Young," as an example of what a successful book for children is. Those three books, all of them short made the reputation of their authors.

Below is the reprint of the cutting you have kindly sent us.

Ants Have Fire Departments

The discovery that some ant hills have fire departments has just been made by Mlle. Marguerite Combes, French naturalist. She placed a lighted taper on a hill and a batttalion of ant firemen extinguished it. Some squirted liquid formic acid from their jaws on the taper. Others tore at it. Many perished. One hero dragged another from danger.

Mortals are just beginning to understand how "human" the insects are.

—EDITOR.)

THE publishers need copies of every issue of AMAZING STORIES Magazine published in 1926 and 1927, and they would appreciate hearing from anyone who has any or all of these copies and is willing to part with it or them.—THE PUBLISHERS.

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